BULLETIN

OF THE

AMERICAN GEOGRAPHICAL SOCIETY.

Vol. XXIV 1892 No. 4

THE RIO DE LA PLATA—ITS BASIN, GEOGRAPHY AND INHABITANTS.

BY

THOMAS MORONG.*

The river system of La Plata, if we consider the extent of its drainage area and the number of the tributaries by which that area is traversed, is the second largest fluviatile system in the world. It is surpassed only by the great Amazonian system, just south of which it rises. The Nile and the Mississippi are longer rivers than either of the chief Plata affluents, the Uruguay, the Paraná and the Paraguay, but neither of them possesses so many navigable tributaries, nor covers such a wide area with so many fluvial ramifications. The general course of this system is from north to south, traversing a distance of 23° of latitude, from 12° 30′ to 35° 30′ south latitude, or, if we follow the windings of

* This paper was originally given as a lecture with stereoscopic illustrations before the American Geographical Society, which will account for the familiar, personal style observable in some parts of it.

the Paraguay and Paraná, nearly 3000 miles from their sources to the Atlantic Ocean.

This vast system of inland waters drains a surface of not less than 2,000,000 square miles, and pours a volume of water into the sea which has been estimated to exceed the aggregate discharge of all the European rivers put together. This is to be expected from the peculiar conformation of the South American continent, which is in many respects unlike that of any region on the globe. On the west, or the Pacific side, there is a strip of land scarcely 200 miles in breadth, covered with mountains consisting of the Coast and interior Cordilleras and the intermediate range known as the Andes, some of the magnificent peaks of which rise 23,000 feet into the air. The warm equatorial winds of the Atlantic, loaded with vapor, strike these lofty sierras, and are completely emptied of their moisture, which rolls down the Andean slopes in floods of water that find their way to the sea through the Amazons and the Plata, watering the whole region, and making it not only a mass of living verdure but a land of unsurpassed fertility, and at the same time a grand, finely dissected highway of inland commerce.

As might also be expected, the rainfall throughout this region is almost continuous the year round, and of prodigious volume. I saw freshets at Asuncion, in Paraguay, about twenty feet in height. On the Pilcomayo we were treated in a single night to a rise in the river of ten feet. In fact, I could see the water rise inch by inch, until what was at night-fall a quiet stream scarcely a foot in depth became a roaring river ten feet deep by 10 o'clock the next morning. The annual rainfall in Paraguay, never less than sixty-five inches, is in some

years as much as eighty inches. A traveller in southern Brazil states that he was detained on the Tibagy river from the second to the twenty-fifth of July by a flood which, after a continuous downpour of nine days, raised the river thirty-three feet in height at a spot where it was 200 yards wide, pouring along 90,000 cubic feet of water, some twenty-five times its volume at low water mark. The Uruguay has been known to rise at some points fifty feet in height in times of freshet. From these facts you will perceive that the country of which I speak may almost be said to be equally divided between land and water.

I shall now invite you to accompany me on a voyage from the mouth of the grand Plata estuary to its sources in the highlands of Brazil and Bolivia, while I endeavor by description and pictorial illustration to give you some idea of what I have seen in a trip over that route. We will, if you please, take our start from Lobos Island, the first land we made after a voyage of seventy days from Boston harbor. Lobos, or Seal Island, more fortunate than our own Pribylov Islands in Bering Sea, untroubled by Canadian poachers, yields a handsome revenue to Uruguay, and around this we saw thousands of seals disporting themselves in the open sea. Soon after taking a pilot off this island, the low sand-hills of the Banda Oriental, or the purple land, as its inhabitants love to call it, which first of all in this zone is touched by the rays of the morning sun, came into sight. The eastern contour of the Plata estuary is essentially different from that which occurs on the Argentine or western shore. On the left bank, or the Uruguay side, the land is rolling, often rising into bluffs, at first low,

afterwards reaching in the uplands of Entre Rios a height of 150 or 200 feet. Some portions of it are quite rocky, the rocks consisting of clay-slate, gneiss and granite, which also form the islands of Sola, Las Hermanas and Martin Garcia in the river above Buenos Aires, where the granite is quarried for the pavement of that city. From Maldonado we ascend for sixty miles to Montevideo, the capital of Uruguay, a beautiful city, with a population of 120,000 souls, of much commercial importance, but greatly hindered in its development by its lack of a harbor and depth of water. In fact it is a mere open roadstead, with a water-front so shallow that no vessel drawing over six feet can get within a quarter of a mile of the shore. Passengers are obliged to land in small boats, and all cargoes are shipped in lighters, while the wind is so boisterous that you and your luggage are deluged with spray and water during the short passage between the vessel and the custom-house. One is struck not only here but also throughout the Plata rivers and the Pacific coast with the lack of judgment shown by the early Spanish settlers in choosing the sites for their ports. Even Valparaiso, the chief seaport of Pacific South America, is merely an open roadstead into which the northers sometimes blow with such violence that all the vessels are obliged to make for the broad ocean to avoid going on shore. The large sea-going steamers always lie at Valparaiso and Montevideo with steam up, ready to put out at a moment's notice.

From Montevideo we cross to the Argentine side, and now we come upon totally different scenery. Standing upon the lofty quarter-deck of a bark of nearly

a thousand tons burden, I could scarcely see the land till we were within half a mile of it, so low does it lie. Here and there I could just discern a tree which appeared to rise out of the water. This is the land of the celebrated pampas—great tree-less, hill-less and rock-less plains, almost as level as a floor, elevated only from six to twenty feet above the sea. There is but one indigenous tree on these plains, and that quite rare, the Ombu, a phytolaccaceous tree some thirty or forty feet high, buttressed about the base with large knees, and with wood so soft that by a single blow an axe can be buried in it almost to the head. These immense plains, extending 400 miles from La Plata to the foot of the Andes, are nearly 1000 miles in length, overgrown for the greater part with tall grass and gigantic thistles fifteen feet in height.

There is strong evidence that this whole pampa formation was at a comparatively recent period the bed of the ocean, and has been created by a gradual deposit of detritus swept down by the Paraná and its tributaries. At its northern extremity, near Santa Fé, sea-shells, some of them of existing species, are obtained by excavations in the earth, and throughout the pampas are dug the fossil remains of extinct mammalia, which must have been buried by the silting up of marsh lands. Many of them were doubtless washed down by floods into the locailties where they lie. In the great Museo Nacional at Buenos Aires are preserved, through the industry of the celebrated paleontologist, Dr. Burmeister, the remains of twenty-four of these ancient mammals. Among them are the Megatherium, in some of its dimensions surpassing all known quadrupeds, living

or extinct. It measured 6 feet across the haunches, twice the size of the largest elephant. It was from 12 to 14 feet in length, to which its tail added 5 feet more, and in height about 8 feet. This huge body rested upon massive legs, and the claws of the fore feet were a yard long. The structure of the teeth proves it to have been a herbivorous animal, and without doubt it fed upon the branches and leaves of trees which its gigantic strength enabled it to bend or break down. Akin to the Megatherium, and nearly as large, is the Mylodon.

One or both of these huge creatures must have been the ancestor of that strange arboreal South American animal, the sloth, which, notwithstanding its comparatively diminutive size, is closely allied to them in structure.

Besides these is another of immense proportions, known as the Glyptodon, which had a coat of mail in one piece nearly six feet in length, embossed with ossicles in the form of rosettes, an armor which enabled it to defy the most powerful carnivora of its age. Ludicrously enough, this ancient monster is almost exactly reproduced by the liliputian armadillo, which abounds in the same regions to-day, and which we often had served upon our table whole, roasted in the shell. Of other interesting fossils contained in this collection I may mention two species of mastodon, and what is still more interesting, remains of the horse and the bear, neither of which has been known as a native wild animal of South America since it was settled by civilized men. The wild horse is known there, but it is the modern sp ecies introduced by the Spaniards. The only thing

resembling the bear is an insignificant harmless animal of the plantigrade family, called the *coati*. The extinct horse (*Equus curvidens*) which has also been found in the caves of Kentucky, and the bear, closely allied to the living species of North America, are of special interest as showing the connection which must have existed in prehistoric days between the northern and southern portions of our hemisphere.

Skirting by the pampas, we strike out into the great estuary on our northern voyage. We note as we go the yellowish, muddy character of the water, which is evidently filled with earthy sediment brought down from above. We also note the entire absence of aquatic vegetation. One would suppose that these South American streams would abound with water vegetation, but the botanist in search of such growths will be greatly disappointed. This is not owing to the saline character of the water, for the water of La Plata is fresh enough at Montevideo to be drunk; but the constant deposit of sediment on the bottom of the river overpowers all vegetable growth. So great is this that new banks are constantly forming, and the channel is continually altering. No river pilot, however experienced, knows from day to day where the channel will be tomorrow, and, in consequence, large vessels are constantly running aground at unexpected places.

After a voyage of 100 miles, we reach the largest city in South America—Buenos Aires. Here again we are astonished that a seaport of such magnitude should be situated in such an unfavorable spot, for so shallow is the water that we are obliged to anchor four miles from the city. The town lies broad to the river,

here thirty-four miles wide, and when the pampero, the great hurricane wind of southeastern South America, blows fiercely from Patagonia across the pampas, it makes havoc not only with the shipping in the outer roads but also with the buildings of the city. Until within a recent period all passengers and cargoes had to be carried on shore in small boats and lighters, and even then, so extremely shallow is the water and so entirely unprovided were the people with piers, that everything had to be carted out of the small boats to the shore—the passengers in a high-wheeled vehicle which resembled a crockery crate on a cart bottom. This had a shaft fastened to the saddle of the leading horse, and hooked at its end in a ring, so that the rider could turn the animal around it as on a pivot and push the cart before the horse when going into the water, and then turn him around and pull the cart out when the passengers had tumbled in. The Argentines sometimes call themselves the Yankees of South America, and certainly this arrangement savors of Yankee ingenuity.

A few years before my visit the citizens of Buenos Aires saw the error of their way in permitting this primitive Spanish method of landing to continue. The perception of their duty to shippers and travellers was greatly quickened by the action of the business men of La Plata, the capital of the Province of Buenos Aires, no mean city, some twenty miles south of them, which is really an excellent port, with deep water, where the largest man-of-war can ride with safety. The merchants of La Plata constructed a number of fine docks, and made an eager bid for the commerce of the world.

This competition stirred up the Porteños as no regard for the convenience of the travelling and trading public could ever have done. They set their engineers to work in earnest, and at an expense of $50,000,000 have altered the whole shore front of their beautiful city, and sent the landing-cart into limbo.

Where the adventurous tourist used to climb out of a rocking row-boat into a springless, high-wheeled cart, at the imminent risk of catching a ducking, or of faring worse, may now be seen a fine mole, extending a hundred yards into the water. At this point begins a broad river-side promenade, which is adorned with beautiful parks, fountains and squares, and designed to run for several miles along the borders of the river. When completed it will form one of the finest driveways and promenades in the world.

In addition to this, a capacious *dársena*, or canal, has been cut for half a mile into the heart of the lower part of the city, about 200 yards wide, and twenty or twenty-five feet in depth, on the sides of which good landing piers have been constructed. This is near the mouth of the little Riachuelo, or the Boca, as it is commonly called, in which a vast number of vessels formerly crowded. On the other side of the Boca a similar *dársena* is to be dug. The channel between these landing places and the deep water of the Plata is kept constantly dredged, so that now by artificial construction Buenos Aires has remedied the ancient Spanish blunder, and become a good seaport, thus, at an enormous outlay of money, maintaining its commercial supremacy. In rambling about this ancient Spanish town one sees many odd things, as well as many beautiful objects.

Among the oddities are the narrow streets and narrow side-walks in the older parts of the city. Through the narrow streets tram-cars dash at headlong speed, the driver lustily blowing a high-pitched cow's horn to warn pedestrians to keep out of the way. As you saunter along the streets, you are suddenly confronted by a gentleman, who thrusts his hat into your face and begs you *por amor de Dios* to drop a trifle into the crown. You have often, I presume, supposed that the beggar on horseback was a traveller's fiction. I assure you that in Buenos Aires he is a reality, and that he is duly licensed by government, as appears from the placard on his breast. Nobody in these countries walks if by any possibility he can contrive to ride, and horses cost only five or ten dollars apiece. Why should not the beggar ride? He certainly sees no reason why he should not, any more than he sees a reason why you should not contribute something towards his support. The *hornero*, or baker, rides with two huge pannier baskets full of bread strapped across his sheepskin saddle. The *lechero*, or milkman, rides on horseback, his milk-cans on each side, his person wrapped in a gaily spotted *poncho*. If you prefer to make sure that your milk is not mixed with water or chalk, a man will drive his cow to your door and milk the unadulterated article directly into your pitcher.

There are many handsome gardens, *plazas*, streets and buildings in this city, and its people have reason to be proud of their enterprise, their good taste and their educational institutions. The greatest danger to the future prosperity of the city, which now boasts of a population of half a million people, and of a harbor full

of ships bearing at their mast-heads the flags of all maritime nations, arises from the action of the river itself, as we shall see when we take one of the handsome steamers of La Platense, and proceed to the delta at the head of the Rio de la Plata. Unfortunately Buenos Aires is below the delta; were it above, as New Orleans is, it would be safe. The lower end of this great delta, or riverine deposit, is only forty or forty-five miles above the city, and year by year it is slowly but surely creeping upon the town. In past ages it has been formed by the action of the Paraná alone, but now it is greatly accelerated by the co-operation of the Uruguay. Vast quantities of muddy sediment are swept down by the current of these two great streams. Every year the estuary grows shallower. The trend of the channel is towards the opposite bank, thirty miles away from Buenos Aires. Unless therefore some means are found, either by a system of jetties such as that employed to deepen the channel of the Mississippi at its mouth or otherwise, the calamity is inevitable. In process of time it is quite possible that Buenos Aires may be left high and dry, from ten to twenty-five miles from the Plata. The delta must find its way to the ocean, and this broad estuary become pampa land with a river from one-half a mile to a mile wide running through it. The only question is whether modern engineering is capable of compelling that mighty river to continue to wash the feet of Buenos Aires.

I will not detain you with any lengthy description of this delta, by which we now pass for a distance of 175 miles through one of the many channels by which it is traversed. All I need to say is that it resembles in many

respects the delta of the Mississippi—crowded with islands, among which wind numerous creeks and bayous—much of it low and marshy—many of the islands inhabitable, covered with peach trees, which grow here in perfection. In looking upon these islands, we see for the first time something of the tropical vegetation, which will increase in beauty as we ascend toward the equator. The borders are fringed with grasses and aquatic plants. The smaller streams are arched by tessarias and willows whose pendent branches dip into the water and form a grateful shade for the boats of the peach-gatherers. Luxuriant thickets crowd upon the higher ground, and the atmosphere is redolent of delicate odors. Clambering vines with long racemes of purple flowers, the flaming scarlet of the *ceiba*, the white flowers and golden fruit of the orange, the pink and purple of the peach, mingle their gorgeous hues in such dazzling brilliancy that the eye would be wearied were it not relieved by the deep green foliage which spreads over all.

Passing by the important towns of Rosario, Santa Fé, and Paraná, we pass on for 700 miles to Corrientes, the capital of the Argentine Province of Entre Rios. As we go, we note the fact that mile upon mile of the country is uninhabited. Rarely do we see a farm-house, rarely a brick-making establishment or a timber-cutting station, still more rarely anything that may be called a village. Room for millions of inhabitants is left in its primitive solitude. We note also that the left bank of the river shows comparatively high land, occasionally a bluff, while the other bank remains low, now and then showing a bit of pampa, or sprinkled with meadows.

We shall have occasion to see that both the soil and the tributary streams of the left shore all display a different character from those of the other side. In the one case, the waters roll down precipitously from the neighboring gneiss and granite hills of Brazil, through a granitic and clayey soil; in the other they start 500 miles away among the Andes, and flow lazily through level land of estuary deposit. In the one case the waters, though turbid, are yet fresh and sweet, even limpid in the shallows; in the other they are dark, frequently quite black, loaded with saline matter and unfit to drink.

A short distance above Corrientes, we turn abruptly to the right, and enter the upper Paraná. Now a great change occurs; the current grows so strong, that our steamer labors hard to make any headway. At the Island of Apïpe, in latitude 27° south, a thousand miles from Buenos Aires by the river course, we see this great stream in all its turbulence. Here we encounter rapids which compel us to leave the steamer and travel by land. From this point nearly all the way to the junction of the Parnahyba and Grande, which unite to form the Paraná in latitude 20° south, is a wonderland of rapids and cataracts, 20 or 30 at least, almost any one of which, if found in a civilized country, would be enough of itself to attract hosts of tourists. At Encarnacion we can take steamer again for a short distance. Just opposite this place the famous botanist, Bonpland, while peaceably pursuing his beloved science, was treacherously seized by the Paraguayan tyrant, Francia, loaded with fetters, hurried across the river, and kept in captivity nine years. Here, too, we are reminded of another disgraceful fact in the history of

Paraguay, for we are now in the country of the "Misiones," the land of the *Ilex Paraguayensis*, the *yerba mate* or Paraguay tea, which was first and most successfully cultivated by the Jesuit fathers who came into the wilderness to Christianize the savages. Whatever may be alleged against the Order of Loyola for their political intrigues in Europe, in these distant wilds they were undoubted benefactors to the Indians, for under their mild sway the savage was taught the arts of peace and led to habits of industry, of sobriety and Christian civilization. Under the government of these devoted and self-denying missionaries, the wilderness blossomed as the rose, churches and villages sprang up in all directions. Well would it have been for Paraguay had they been permitted to continue their beneficent labors, but an insane jealousy sprang up against them in the capital of Paraguay, and after 150 years of prosperous culture, the missions were broken up and the fathers banished from the country by orders from the Court of Spain. The Communities were destroyed, the savages driven back into the forest and their native wildness, and the land became once more the desolate wilderness which we now traverse.

Now for 100 miles we ascend this swift-rushing stream, passing high cliffs, over which nearly all the tributaries of the upper Paraná plunge in noteworthy cascades and cataracts. Only one of these can we stop to particularize, the magnificent but little-known cataract called the "Salto Victoria," or the "Hundred Cataracts." These falls occur on the Iguazú River, a branch of the Paraná, about twenty miles from its mouth. Passage can be had to within a few miles of the falls by a small

boat, though the boiling current and frequent whirlpools and rapids make navigation very dangerous. For the last four or five miles by land the route is desperately rough. One must scramble over broken and jagged rocks, crawl through dense jungles, over fallen tree-trunks, torn with briars, burned by the blazing sun and half devoured by mosquitoes. But the grand spectacle of these falls in all their grandeur well repays the traveller for the dangers he has encountered and the toils endured. Here are collected within the radius of a mile at least twenty streams of water, large and small, which pour over a precipice in one place 150 feet, in another 75 feet in depth, making a plunge of 225 feet from the extreme top to the bottom of the chasm, or 60 feet of descent greater than Niagara. The falls have been divided by the German engineers, who made a survey of them in the year 1883, into three groups, the upper on the Brazilian side, a central stream, and the lowest on the Argentine side of the river. Above the falls the river spreads for a distance of three miles, then, running down by various channels, contracts to a mile, and in two broad streams, separated by an island, makes its first plunge on the Brazilian side. On the Brazilian side we have a horse-shoe fall similar in shape to Niagara on the Canadian side, 2000 feet in width on the brink.

The falls on the Argentine side have a long, straight brink 1200 feet is length, divided into numerous streams, all thundering down into the same deep chasm.

These mighty masses of water finally combine in a leap down into a narrow gorge of overhanging cliffs 500 feet in height, through which the whirling, seething

torrent rushes like the rapids of Niagara, throwing clouds of spray and mist into the air, and with a deafening roar which may be heard twenty miles away.

The numerous tributary streams pouring over these cliffs, together with the principal cataracts form such a bewildering mass of falls, that one is utterly overwhelmed with the sublimity of the scene; and probably for combined beauty and grandeur of scenery, for wildness and variety of aspect, the "Hundred Cataracts" stand unsurpassed.

Let us now ascend the river in the track of an adventurous botanist, Prince Maximilian of Neuwied, who passed over this route seventy-five years since. We might go a part of the way by water were it possible to procure a boat, but as our predecessor journeyed overland we will take a troop of peons and mules and push across the broken country. At sixty miles distance we reach the great island of Guayrá, where another celebrated waterfall greets our sight, one which is second only to the Victoria Falls, but which I may not stop to describe.

Yet another still further up lies in our path, the Falls of Urubupunga, before we stand upon the highlands of Brazil and find the spot at which the Paraná begins its mad descent of 2000 feet of precipices on its course to the Atlantic. And now, "far from the madding crowd," we enter the vast primeval wilderness which has seldom heard the footfall of any other creature than that of the wild beast or of the roving savage, nearly as wild. Who can describe a Brazilian forest? Who depict its solemn solitude, its dark, sombre glades, its gigantic trees, its dense and tangled jungles, its brilliant-hued

flowers, its masses of verdure, its profusion of vegetable life? Here are the giants of the forest, shooting 150 feet into the air, whose trunks fifteen men with outstretched arms can scarce encompass, and which are supposed to be older than the Christian era. Beneath their lofty arches one walks as if in cathedral aisles, in shadows scarcely ever penetrated by the rays of the sun.

Now the gnarled roots of sylvan kings bar your progress, and dangling *lianas* hang like ropes from their huge limbs.

Again you are met by a dense mass of palms, of broad-leaved begonias and climbing vines which twine about the trunks of the trees and hang in graceful festoons from the limbs, sometimes so enveloping their hosts that they fairly overpower the strongest tree and choke it to death in their anaconda grasp. And the wealth of parasites which clamber over these tropical trees can scarcely be measured. Here are orchids of brilliant hue, of strange, grotesque form, which would be regarded as priceless gems in our conservatories, clinging to trunk and limb in such enormous profusion than one can scarcely see the bark, every fallen trunk and dead limb bearing such a host of forms that even the botanist is amazed at their number and variety.

If our visit should happen to be in midsummer, perchance we shall fall upon such a sight as this, a nearly leafless vegetation, even the palm almost denuded of its fronds, and encircled by stalks of desolate-looking cacti, which show little sign of the gorgeous flowers with which they will be clothed in the rainy season; and, strangest of all, the bloated, bottle-shaped trunks of the *Cavanilleria*, found only in these wilds.

Escaping from these dense woods, the weary traveller is glad of a brief respite of repose beneath the branches of the Brazilian *Araucaria.* Its fragrant breath, its thick, needle-like foliage, the murmur of the gentle wind amidst its boughs, remind him of the grand old pines of his northern home. It is not a pine, however, although it belongs to the *Coniferae.* No pine is found in South American forests. The people there would gladly exchange all their hard timber trees, their numberless polishing, dye and medicinal woods for those invaluable forests which we are destroying with such reckless greed. There is no substitute for pine as building timber the wide world over. May God speed the time when an enlightened Government shall throw over it and its kindred timber trees the aegis of its strong protection, and say to the avaricious wood-cutter: "Thus far shalt thou go and no farther." But as we rest under the shade of this semblance of the pine, let us note the difference between it and the so-called "Araucarian pine," which grows in immense forests over Patagonia and the Chilian Cordilleras. The latter is much more like a cedar than a pine, but with straggling, short-leaved limbs which show gaunt and naked against the sky.* The Araucarias are the nearest approach to our conifers of which South America can boast, but as timber they are comparatively worthless.

Now that we have rested, let us follow the groves of Araucaria. They will lead us out upon the brown rocks

* The Brazilian tree, on the other hand, has thick, bushy-leaved branches which spread out almost horizontally, forming great flat-topped heads. It is a much larger and far more beautiful tree than its congener of colder regions.

of the coast mountains, among which the Rio Grande takes its rise. Seamed with deep gorges, where the Araucaria finds a scanty soil, the broken rocks, heated by the torrid sun, rise in gloomy desolation. We cannot linger here. The deep shade of the forest is far more grateful. Turning southerly, we follow the smaller rivulets through the tangled mazes of the woods once more. At last we reach the distant limits of the Paraná, and right glad are we to see the walls and spires of St. Sebastian and the gleam of the waters of its gulf in the distance. We throw ourselves under the wide-spreading branches of this splendid bread-fruit tree, and rejoice at the thought that our long trip in search of the sources of the Paraná is ended. As we sniff the delicious, renovating sea airs, which are wafted across the land, we gaze curiously upon the lofty tree and its enormous balls of fruit. We thought that the Artocarpus belonged to the South Sea Islands and the Malay Archipelago. How comes it here? Well, like many another transplanted foreigner, it has found a congenial home far from its native climes, and in the gardens of South America, both east and west, it displays a vigor unsurpassed in its sea-girt islands. Refreshed by this brief outlook upon the Atlantic, we will take the liberty of travellers by photograph, and jump by a single bound over the immense distance we have travelled by mule-back and on foot to the junction of the Paraná and the Paraguay.

At the Tres Bocas we again take steamer for Asuncion and the upper Paraguay. A very different region now appears, as though we were transported to another continent. No longer a headlong stream, leaping down

precipices, but a quiet, somewhat sluggish river, with a current not over two miles an hour, with low banks, reminding one in its peaceful aspects of the lower Mississippi. Indeed this whole river, the Paraguay, is so much like the great Father of Waters in the United States that it might well be named the Mississippi of South America. On the right bank are low woods, not the dense high forests of the upper Paraná or the Amazon; interspersed with marshes; on the left, the rolling lands of Paraguay. Occasionally a native hamlet of a few houses comes into view, sometimes a town like Villeta, the great depot which furnishes oranges for Buenos Aires and Montevideo.* If you are fortunate enough to witness this as I did, at night, you will be treated to one of the most picturesque scenes on the river. The brilliant torches, the double file of women robed in white mantillas, each with her basket of oranges poised on her head, moving down the wooden mole, the merry voices, the hurried emptying of 5000 baskets of the golden fruit into great bins; oranges rolling over the decks; oranges eaten by the passengers *ad libitum*, by parrots, by poultry, by dogs; oranges rolling into the water and devoured by the fishes,—altogether one of the most charming pictures to be seen upon this picturesque river.

As we proceed, the river reminds us more and more of many parts of the Mississippi. Great floating islands of "Camelote," an azure *Eichornia*, one of the most common aquatic plants of this region, come down to

*Here are stored enormous piles of this delicious Paraguayan fruit awaiting transportation. They are carried on board of a steamer by women along a narrow wooden causeway.

meet you, broken away from the banks by the current. Beautiful woodlands on jutting points stretch out into the water, to be succeeded by a wide expanse of water with a solitary tree, the graceful Timbo, standing upon the banks. Again you see the placid stream winding far into the distance, with a brick-yard, one of the most common industries in Paraguay, in the foreground, or, perchance, a brick barge loading on the river brink from one of the high-wheeled native carts, which has backed down in the water to the side of the boat.

If you stop long enough at one of the small landing-places, you slip on shore, and wander into the interior. No mountains or highlands obstruct the view, but there is a special charm about the most characteristic scenery of all this region—the "campos." A *campo* is essentially a pampa, consisting of rolling plains rising occasionally into hillocks, covered with pasturage grass and broken with clumps of *monte*, or wood. Immense herds of grazing cattle wander over them. Such diversified prairies cover the whole of the central and southern portions of Paraguay and the whole of its western territory, that extensive uninhabited region called the "Gran Chaco."

As you wander by delightedly over this fertile grassy prairie, you enter one of the clumps of wood, and come upon a native Paraguayan house.

The people are all out of doors—women, children and dogs. Men you do not see. Great lazy dogs the Paraguayan men are; they are probably away at a cock fight, or loafing in some *boliche* or drinking-house where they love to while away the time in quaffing the

native *caña* and playing cards. No work will these lords of creation do so long as they have a *real* in the pocket. The wife must earn the living and support the family, and here, as elsewhere in the world, woman is faithful at the post of duty, however worthless her mate may be.

The house is rudely constructed of palm logs, thatched with grass or covered with hides or old sticks, whatever comes handy. One or two heavy chairs or perhaps nothing but stools or blocks of wood for seats, and a rough board table, with several hammocks slung from the logs, form all the furniture; the floor is of earth; doors and windows there are none; the cooking is done in that round brick oven, looking like a bee-hive, which stands in the yard.

Nine-tenths of the population are of mixed Spanish and Guaraní Indian blood, and such are the people who now accost you. These women have the oval face, the olive complexion, the brilliant black eyes and long eye-lashes of Andalusia, and the coarse black hair of their Indian ancestry. They greet you with all the courtesy and hospitality of the Spaniard. Such as it is, their house and all it contains is at your service. Water and *mate* they will offer you, wine if they are able to afford it, and the inevitable cigarette.

If you can speak Guaraní, you will find them a merry set, and they will send round to all the neighbors and improvise a dance in your honor. If you can only speak in Spanish, they can muster enough to direct you on your way—"La Inglesa, no entiendo, Señor."

Resuming your voyage, you soon perceive that you are approaching some important place by the washer-

women on the banks. Laundries are not a native institution by any means, but foreign residents have brought soap and water into requisition in all South American countries, and now the washerwoman is the herald of civilization. Quick to discern the means of earning a penny, these Guaraní women have caused the sound of the laundry paddle to be heard all over the land. The first view of Buenos Aires shows you innumerable women, clad in white robes, squatted upon the river banks, and industriously rubbing, pounding and patting clothes. This sight is repeated all the way up the river at every town of considerable size. Wherever you may go in the country, at any wayside pool or brook, you hear the sound of laundry beating long before you come upon the beaters. The operation is invariably performed with cold water and out of doors. As for the *ironing*, well, the less we say about that the better.

I used to think that my clothes were ironed in Paraguay by being sat down upon by the laundress. As a general thing, they were innocent of starch. You *can* get your things starched in Paraguay, if you will buy the starch at a high price, send it to the laundry woman, and insist that it be put in the garments, but you will find that you had better be content with limp collars and cuffs, even if they are beaten into rags. Be satisfied with being *clean*. Cleanliness is next to godliness, and a far-away next is about all that you may hope for in this country.

Now comes into view the highest point which occurs between Buenos Aires and the capital of Paraguay, the mount of Lambare, a conical hill some nine or ten miles east of Asuncion, 300 or 400 feet high, at the foot of which

lies the famous chief Lambare, for whom it is named, and whose bones, long ago mouldered to dust, the superstitious natives hold in such dread that none of them can be induced to ascend the eminence above his grave.

Next, "Haipaita Punta," a projecting headland of porphyritic rock, crowned with shrubbery, and backed by a low hill, meets the eye.

We round this and are in sight of Asuncion, the oldest town in the South American continent and, there is reason to believe, the oldest surviving town on the western hemisphere. The boat anchors in the stream, though there are piers to which she might fasten. The rule everywhere along this river is to compel the passenger to get himself and his luggage ashore in a small row boat. No steam company cares enough for the comfort of passengers to construct wharves, and no sharp public opinion compels it to care. The people are content to submit meekly, as their fathers have done before them, to inconveniences and spoliations on the part of transportation managers which would not be permitted to exist a day in this country. On one occasion while at Asuncion I engaged passage to Buenos Aires, and as my servant was about to carry my traps on board of the steamer which was lying at the pier, we were ordered to go around to the water steps on the other side, in order to do which entirely unnecessary thing, I was compelled to take a small boat near the same pier and row just around the bow of the steamer, perhaps a hundred yards, paying the boatman two dollars for the service, though he angrily insisted on having twice as much. I had learned by that time that the regular fare for such service paid by natives was just fifty cents. How often

did I wish that an enterprising Yankee company would take half-a-dozen Mississippi steamboats which could land against the shore anywhere along this river as they do on the Mississippi, and ply a line between Asuncion and Buenos Aires. I believe that with such boats and with the promptness, ingenuity in overcoming difficulties and accommodating spirit proverbial among our managers of transportation, such a company would soon absorb all the business on the river.

We cannot linger long in this ancient town, only long enough to take a look at its square, one-storied, stucco-covered houses, with great bars of iron across the windows, without chimnies, and with flat roofs covered with curved red tiles, reminding one of Pompeian residences. We take a stroll along its unpaved streets, in the deep argillaceous sand, in which no sound of cart-wheels can be heard. No cab, no omnibus, no carriage, private or public, is known. You must either walk, or ride in the long, heavy, lumbering tram-cars, and one ride in them is quite enough to satisfy your curiosity. Lucky for you if they do not jump the track every 500 yards. The driver lashes his sorry-looking team of mules into a feeble gallop. Every bone on the back of the hard-worked beast stands out like an exclamation point to protest against the cruelty, and you feel like crying out in remonstrance when a craunching sound is heard and a jar ensues which sends you first sideways and then forward against the seat in front of you, and the whole concern suddenly stops. It is off the track, much to the joy of the mules I am sure, and much to the amusement of the passengers, to judge from their looks. The conductor gets out and deliberately walks around the

car, looking under it first on this side and then on that. The driver gets down. He, too, peeps underneath at various angles. Then the two enter into conference. Several street loafers come up. They look underneath. Then they all have a general debate in Guaraní. After ten minutes or so is spent in this consultation, which is all Greek to your ears, the men range themselves around the derailed car, take hold of its frame, and amidst many yells, first one lifts and then another, and finally by accident all lift together, but the car does not stir an inch. Then the passengers, who all this while have been sitting in their seats, long since inured to patient waiting by many experiences of the sort, and many of them laughing at the mishap, get out. Another effort is made, with no success. Another car comes up from behind, and one on the other track from the opposite direction. All the drivers, conductors and loafers lend a hand. Then with a frantic "arriba!" the car is hoisted, and the end which is off the track is moved three or four inches, and settles down again into the sand. Once more "arriba! arriba!" from a dozen throats, and your vehicle is triumphantly hoisted into place. As you are in no hurry, all this lends piquancy to your ride. Then you vary the scene by a walk, and wonder at the variety of sidewalk which you encounter, now sunk below the street, now three feet above it, with or without a flight of steps to climb the higher part, as the case may be, now so narrow that men going in opposite directions find it difficult to pass each other, now covered with a pile of bricks or building materials, and again with its bricks all out of place and lying loosely about like stepping-stones in a stream of sand. You

meet with scores of bare-headed and bare-footed women, with water jars or other burdens deftly poised on the head, policemen or soldiers (they are the same thing here), wearing a short dark blue sack ornamented with brass buttons, a cap of similar color, white trousers, bare-footed, with a sabre hung at the side. You see no ladies, for rarely do any Asuncion ladies walk on the streets. You pass many well-dressed gentlemen, who always salute you by touching the hat and saying, "Buenos dias."

Enough for Asuncion. Let us take the Brazilian steamer which runs about once a fortnight for Cuyabá in the Brazilian province of Matto Grosso, near the head waters of the Paraguay. We pass many lagoons filled with that gigantic lily, the Victoria regia, many floating islands of *camelote*, many swamps, many patches of *campo* and *monte*. We stop a short time at Villa Hayes, named in honor of our President Hayes, who decided a boundary question between Paraguay and the Argentine Republic in favor of Paraguay. By degrees the campos disappear and high land appears. Pan de Azúcar, Sugar Loaf, a volcanic peak about 1300 feet high, is the beginning of a range of wooded hills and mountains which stretch eastward just north of the Paraguayan boundary to the river Paraná. To the west is Bolivia, to the north the southwestern extremity of Brazil. In two days we reach Cuyabá, the principal town of Brazil in this region.

From that point one may ascend in a small steamer 150 miles farther, and from there in a canoe to the head waters of the Paraguay. A small lake, surrounded by beautiful Mauritia palms, is pointed out as the source

from which this great river flows. This stands on the water-shed between the Amazon outflow and the Plata system. The land is scarcely 500 feet above the level of the sea, and the water-shed so narrow that it is said a canoe may be easily dragged overland between the uppermost waters of the two great streams. Indeed, in seasons of heavy rains, many pools and marshes are formed between the two, and a little more would actually open a communication between them.

The waters starting here, almost under the equator, wind their way by a gentle descent for more than 2000 miles to Montevideo. Laden with equatorial heat, they carry down a tropical temperature to the ocean. A soft, genial climate, scarcely equalled anywhere in the western hemisphere, the sanitarium of all southeastern South America, is thus produced in Paraguay, half way between the extreme points. The climate of this little country is delightful beyond description, neither too hot nor too cold, free from epidemics and chronic diseases. It is a source of exquisite pleasure, of which I never grew weary, to bask in its balmy zephyrs and to watch its beautiful azure skies, which are not surpassed by those of Italy. The splendors of the southern cross and the Magellan clouds and other constellations which fill the heavens with glory at night, the magnificent moon-lit evenings and the sweet, fragrant atmosphere which tempts him to sleep out of doors, are to the traveller from northern climes something so enchanting that he fears to see the picture melt away as he gazes upon it.

Thus far I have spoken only of the left or eastern bank of the river. Now as we descend let us give a

brief glance at the other shore. It is almost another continent, formed of alluvial deposit, much of the existing land washed down from the Andes. This is the wild, mostly unsettled region of Brazil, Bolivia, Paraguay and the Argentine Republic, extending over an area of 270,000 square miles, and occupied mainly by tribes of roving Indians who have maintained their independence ever since the Spanish conquest. In this region the rivers Otuquis, Confuso, Negro, Pilcomayo, Vermejo, Salado and Tercero run through many leagues of low land from the Andes to the Paraguay and Paraná. Their currents are very muddy and saline, and in many spots they are choked with a dense growth of grass and aquatic vegetation through which it is impossible to force a boat. Salt licks, muddy swamps, *palmitas*, or palm groves, dense thorny jungles, patches of large trees like the Lepacho and Quebracho, and many open, grass-covered *campos* are the prevailing geographical features.

I have said that this immense region, all the way from Matto Grosso in Brazil to Rosario in the Argentine, is inhabited by tribes of nomadic Indians. Before finally leaving the country, we will call upon one of these tribes, whose only connection with the government is a quasi allegiance to Paraguay. The Catholic priest visits their abodes occasionally, baptizes their children and instructs them in the rudiments of the Christian religion ; but for the most part they wander from place to place and live by the chase. Here is one of their *tolderías*, a rough wigwam, capable of holding half a dozen or more families. It is made of upright poles, with other poles laid across them and covered

with a rude thatch. Pots and kettles hang upon the poles or lie scattered around the entrance. The Indians themselves are clad in a blanket or piece of cloth which is fastened at the waist and drops to the knees. Seventeen of these tribes still exist, each few in number, and apparently doomed in time to become extinct. The people we look upon are Lenguas. The cacique Cuira, is a stalwart man six feet in height, broad across the shoulders, with a commanding presence which would make a marked figure anywhere, and, withal, a man of great intelligence. His warriors are large, muscular men, and, though armed only with bow and arrows, are an enemy by no means to be despised. The Tobas are the largest among these Chaco tribes, occupying all the country around the Pilcomayo river. They are divided into a large number of sub-tribes, varying in size from ten to two hundred able-bodied men, each governed by a chief, who, however, has but little authority except in times of war. As a rule, these Indians bear a marked resemblance both in features and habits to our North American Indians. That they sprang from the same stock is, I think, quite evident. Unlike the great nation across the river, the Guaranís, they have fiercely maintained their independence, often fighting desperately among themselves and always hostile to the Spaniards. They are slowly but surely diminishing in number, and dying out before the advance of civilization. The Guaraní race, formerly the most enlightened of all the Indian population of this region, were at the same time the most peaceable. Once very numerous, they occupied the whole country from the Amazon to the mouth of the Plata. They submitted

to the Spanish conquistadores, blended with their conquerors, adopted the laws, customs and religion of the foreigners, and to-day their language and many of their ancient customs are still preserved in Paraguay. As between these two, the fierce, untamable savage who resists, and the mild native who accepts the influences of civilization, the Indian problem is solved. The former must perish without remedy. The latter will survive under higher conditions.

THE VINLAND VOYAGES.

BY

PROF. CHARLES SPRAGUE SMITH.

The scientific spirit, that rules the present, is teaching us how to separate fact from fiction, objective truth from the distorted images left upon the mind by passing phenomena and interpreted by errant faculties. What a disturbing influence this individual factor introduces into every historical equation! No two of us can bear absolutely concurrent testimony touching a given phenomenon, that at the same moment crossed our sensuous horizons. The vision, the audition, are more sensitive in the one instance, the memory more tenacious, the power of exact regiving of the impressions received more alert and complete.

The historian listens with calm impartiality to our discording reports and states, as his verdict, that which, in his opinion, is in most exact accord with impersonal truth. Yet, in proportion as he is loyal to truth, he recognizes and acknowledges his own liability to err in judgment. This written verdict receives through the printing press greater assurance against later wilful change and incautious reading. The personal element is thus, as far as may be, eliminated. In this manner, the records of the present are being transmitted.

But we know that not merely the art of printing but

also the art of writing are modern helps to tradition. Furthermore, the shut-in life of the student, dweller in the past rather than in the present, is recognized only in the late stages of civilization as a worthy employ of manly energies. When, therefore, we return to that past of out-of-door living and of oral tradition, the tests of historical accuracy can not be identical with those applied to records prepared by modern historians of recognized authority. Nor can our mental attitude remain unchanged. New tests must be sought. Our mental attitude becomes rightly one of incredulity.

The first test we, as historical students, must apply, in determining the value of early records, is that of accordance with natural laws and known physical conditions. Could the alleged occurrences have taken place? If so, is there in the attendant conditions an over-weight of probability for, or against, the record?

If these questions are answered to our satisfaction, we bring the record to the second test. Was the temper of the race and age that produced it historical or the contrary? Here we shall be aided in reaching a conclusion, if other contemporary records of the same society exist, whose historical worth we can determine by the sequence of events deriving therefrom and recorded in later writings of recognized integrity.

We find in all early records the atmosphere of the localities and ages that produced them; the folk delusions and false interpretations of natural phenomena, distinctive of the separate peoples. The personality of the story-teller appears also at times in the moulding and coloring of the narrative and in the insertion of elements, born of his own imagination, but readily ac-

cepted by his contemporaries, because agreeing with current superstitions. The presence of these unhistorical elements, where they form only a background or an appendage, and are readily eliminated, does not necessarily lessen the worth of the intrinsic record. Indeed it often gives added value thereto, strengthening our confidence in the integrity of the tradition.

We know the oral tradition only because after a certain period it was committed to writing. We have therefore to consider next the character of the scribe or compiler, who stayed that transforming process, which all oral records continuously undergo, by committing the traditions to writing. He may be nameless, only discovered, if at all, within the record; one of that multitude of early bearers of historic tradition or folk legend, to whom the theme was all, his own individual part in its transmission nothing.

If the scribe is known, we can judge him not only by his work, its spirit, but also, perhaps, by what his contemporaries or the following age have reported concerning him. He was conscientious or otherwise; he was careful and hesitant in accepting testimony, or careless and credulous. His writings will declare it, even if other later workers in the same field have passed no judgment upon him. The position of such a scribe, or scribes, is unique. The stream of past oral tradition, fed from numberless sources, comes to them. They are, as it were, great reservoirs. The outflowing stream that is to nourish future ages will be clarified or contaminated, according as their intellectual vision is clear and their moral sense alert, or both dulled and inert.

If the scribe, who arrested the oral tradition, has reported concerning an alleged fact that interests us above all the associated insertions in his record, we ask whether other scribes, his contemporaries or immediate successors, have recorded or alluded to the same event. Their records, as historical documents, may differ from his in worth, but their testimony, if agreeing in this point, will strengthen our confidence in the trustworthiness of his statement. If manifold witnesses appear and all bear the same testimony, there can be no question as to the general national acceptance at the time the records were compiled of the alleged incident as an actual occurrence. If contemporary foreign records support their statement, it is at least evident that the tradition, whether based on fact or fancy, was so widely disseminated as to attract the attention and win the assent of foreign chroniclers.

The form in which the testimony is presented will also incidentally add to or subtract from its historical trustworthiness. If there is a manifest effort to support it upon props of argument, it is because the scribe recognized that his statement might be challenged. Our suspicions are aroused. We question its worth and weigh his arguments. But, if his tone is that of one thoroughly convinced, addressing those who are as confident as himself; if he does not plead, but simply refers to the alleged occurrence, in passing, as to something universally known and credited; we, in assuming the offensive, attack not the statement of an individual scribe, but the accepted record of a community.

Naturally and justly the fidelity of the existing manuscripts to their archetype, if the original parchment

be lost, demands also our consideration. Here the evidence is both external and internal. The appearance of the manuscripts and the comparison of manuscript with manuscript enables the adept to reach a conclusion. We accept this report as the closest approach to truth we, who are unskilled, can make in the field of external evidence. But, as regards the internal testimony, we may in part depend upon our own judgment, touching the relative and absolute age of transmitted records. The language and literary style enable us to form conclusions of our own, which we can compare with those reached independently by experts in manuscript reading.

We read in the records, preserved in Iceland, of the settlement and early history of the commonwealth, the statement that, about the year 1000, certain lands lying to the south of Greenland were discovered, and an attempt made to colonize them. This alleged discovery happened, according to the record, as the result of accident; a ship on its way from Norway to Greenland being blown out of its course. Iceland was discovered through a similar fortunate happening, so the accepted record states, by a viking, "some say Naddoth," who, on his way to the Faroe Islands, had been driven out of his course.

The Norsemen of that period were accustomed to sail the seas widely. The story of the Norsemen, as it is written in the history and destinies of modern Europe, is a record of bold, strong seafarers. Their galleys appeared off all the coasts of the Eastern Continent, from the White Sea to the Caspian.

We know the character of the seas those Norse gal-

leys frequented. The burial mounds of the North have preserved for us specimens of their boats. Such boats, directed by men such as these were, wonted to the sternness and strength of those North Atlantic stretches, that wash the shores of Old Norse land, would have found nothing more unyielding in the western and southwestern sweep of that same ocean. The distance between easternmost Scandinavia and the American coast is not great. There is no contradiction here of natural law or of existing physical conditions. The strength and skill of man were competent to meet and overcome all natural obstacles in distance, or in power of elements. The statement regarding the western voyages of Norsemen is therefore entirely credible, so far as nature and man are concerned. Even those historians, who declare the Sagas untrustworthy bases for historical inductions, concede this point. Furthermore, there is no essential element in any of the traditions concerning the voyages that is untrue, so far as we know, to the conditions then existing upon those coasts of North America which, according to the record, were discovered and, for a brief period, colonized by Norsemen. The improbability that any Norse imagination at that period could have conceived of a region, according so closely with actual American conditions, in relative position, physical features, vegetation and in the appearance of the inhabitants and their customs, is such, that we can hardly overestimate the value of the negative evidence deriving therefrom.

We turn therefore from nature's ordeal satisfied with the results of our comparison of the Icelandic record with her standards, and ask: what was the temper of

the people; what the conditions of Iceland about the year 1000; what is the character of that literature whereof this record is a part?

Iceland was colonized, at the close of the ninth century, by men, nobles and peasants, who would not submit to the absolutism which Harold the Fair Haired was successfully introducing into Norway. These immigrants came almost wholly either from the southern coasts and islands (Great Britain, the Shetlands, Orkneys and Hebrides), already colonized by Norsemen, or directly from Norway. The character of these settlers is clearly seen in the records of their lives, which have been handed down to us. After eliminating everything which even the most cautious doubting critic would question, the figures and lives stand forth clear and strong against the background of barren, rugged Iceland. They were men of wealth and high station, not infrequently. Their sense of personal worth was firm and full; their love of independence and pride of family vigorous and defiant. Manliness, in a word, as it was then understood, was their distinguishing quality in active life.

Their state organization developed gradually and peacefully out of the existing conditions, a natural growth and fruitage. The young men of better families went very commonly abroad, especially to Norway, before settling down to the round of farming, fishing, law-wrangling, feasting and perhaps blood feuds, which filled the franklin's year at home. In Norway they became often guardsmen of the kings; a relation involving mutual obligation while in Norway, and cementing a friendship but not apparently creating, during the

heroic period, any feudal dependence of the Icelandic franklin while at home. From Norway they strayed widely over the seas as vikings, freebooters of the heroic age, or as peaceful, thrifty merchantmen. It was their pride, on the return from such voyages, to go to the Althing, bravely attired in scarlet robes, with armlets of gold or silver and showy war trappings, given them by their royal patrons.

The social instinct was strong among these islanders; hospitality a religion. Halls were built across the highway even; so that all that journeyed should perforce enter and partake of the food always ready. Neighboring families were accustomed to entertain each other in alternate winters at long feasts, for friendship's sake. During the long, dark winters, out-of-door labor must be largely suspended in Iceland. The halls were spacious rectangular rooms with fires down the centre and rows of drinking benches on both sides; a natural place of gathering, when there was dearth of occupation.

Wherever men gathered, tales were told, tales that at times lasted out the feast. The themes of these tales were personal experiences, the lives of the Norse kings or other Scandinavian rulers; but especially those memories of the fatherland which were of chief interest. We infer also from the Laxdaela Saga that sacred legend had its reciters. Folklore also furnished themes, as we know from the Gretla.*

We can affirm that newness, though welcome, was not an essential in these tales any more than in the songs of Trouvères and Gleemen. For the Icelander

* The Story of Grettir the Strong. Magnusson & Morris. (London: Ellis. 1869.)

had a pride of lineage resembling that of the Hebrews. No individual steps forth upon the stage of the old Norse Saga without our first learning from the writer who his ancestors were.

There had been many bands of colonists, many sturdy Norse stocks replanted in the Icelandic soil. The branches, therefore, do not all spring from a common trunk, though they interlace. There was thus no national sentiment, which would select a few as the standard-bearers of the ideal and transform their homely humanity into heroism. The pride of the little people, not centering upon a few, being one of locality, would naturally prune any exuberant tradition, which should give the patriarchs of a line, wherewith the local story-teller was not affined, undeserved eminence. Furthermore, the sagas, drawn from the lives of contemporaries, that circulated side by side with the elder traditions, would serve as a restraint upon exaggeration.

Whatever may have been the cause, the result is manifest. The sagas that recount the lives of the patriarchs and the events of the heroic age, although colored by the imagination, are not romances, but essentially biographies and chronicles. If we compare in different records the characters given to the same individuals, there is fundamental agreement. The difference only proves the genuineness of the tradition, for the divergence is due rather to the personal equation, the point of view, than to a deliberate purpose to undervalue or overestimate.

We are not indeed groping along an uncertain path, when we seek the source of the later written traditions and inquire whether the stream flows clear of defilement.

There is in the sagas a self-revelation, a truth to all we know of Iceland, that sheds a light upon the entire path which accompanies that stream of tradition. We see it well forth at the courts of Norway, in the booths at the Althing, at the Yule feasts, and we can follow it as it flows, clear of foreign influence, reflecting at times the colors of Iceland's skies, always the forms of Icelandic nature, through the tenth, eleventh and the first half of the twelfth centuries.

Gunnar, on his return from Norway, tells at the Althing his own adventures.* Flosi, who has burned the patriarch Njál in his house, tells the story of the burning in the presence of the other burners.* He does not pervert the Saga, as Gunnar Lambason had done, whose lying utterance had been suddenly changed into a death gurgle by the sword of Kári, Njál's son-in-law and avenger. Kjartan (Laxdaela Saga) diverts the guests, a glad host, at his wedding feast with tales of his own adventures. There were those present who had been his companions, and knew whether he spoke truth. At the court of Harald Sigurdsson (King of Norway, 1047 to 1066) a young Icelander told at Yule-time a story of the king's own journeyings. He had been loath to tell the saga, but it was the only one of his stories left untold, and the king requested it.

The oral saga dealt not with figures, dim and glorified, rising through the mists of a remote past. There is no romantic mistiness about the saga figures, scarce even that fog which on Icelandic heaths gives uncouth bigness to stray nibbling sheep; there is a clear crass reality about the saga figures.

* The Story of Burnt Njal. (Dasent. Edinburgh: Edmonston & Douglas. 1861.)

Iceland accepted Christianity in the year 1000, and fifty years later the heroic age was fully ended. The men of that early period seemed to their descendants cast in a different mould from their own, almost as we conceive the men of our heroic age—the war of Independence. They loved to dwell upon the lives and fortunes of the patriarchs, whose farmsteads they still occupied. Every headland, creek, river, stretch of wild heath and enclosed cultivated field still bore the names given by those first settlers.

There was thus an immediateness, a vividness, a life about the tradition that served both to perpetuate and to control it. It was held to the soil by too many roots; it had too much of homely truth about it, life afield and indoors, for the imagination to pluck it up and plant it anew upon the mountains of the ideal. The colors deepened, the lines became stronger, harsher, the lesser characters less; there was growth, transformation, requickening with every repeating of the Saga; the old stock bore new leafage and fruit every season, but trunk and bough changed scarce at all.

We have therefore no hesitation at all in affirming that those Icelandic records, which relate to the events of the heroic period, are, in the main, reliable as sources of historical data. The folk lore, the exaggerations and minor inaccuracies, the romantic setting and reordering of the historical events, given at times by the Saga teller or writer, need not confuse our intellectual vision or disturb our judgment. The cloak is easily stripped off. The unclothed Saga record carries, then, conviction to every unprejudiced mind. The whole history of Norseland for centuries rests thereon. They who

have examined that under-structure with the greatest care are confident that later research will not remove those foundations. There is, so far as we are aware, no dissenting voice here.

In the prologue of the Heimskringla collection of the lives of the kings of Norway, attributed to Snorri Sturlason (1178–1241) we read, "Priest Ari the wise, son of Thorgils, son of Gelli, wrote first of men here in the land in the Norse language tidings both old and new" This statement, which we have no reason to question, fixes the date of the first passing of the Icelandic tradition from oral to written form at some time prior to the death of Ari, which occurred in 1148.* Ari, surnamed Frothi (the wise or the historian), was born in 1067 or 1068. Queen Aude, one of the noblest and most famous of the first settlers, Björn the Scandinavian, her brother, Hall of the Side, a great chieftain of the East of the heroic period, and Guthrun, the heroine of the Laxdaela Saga, who died only a generation or so before his birth, were among his ancestors.

Ari's father and grandfather died while he was a child of tender years, and thus, at the age of seven, he came to Haukadal to the home of Hall Thórarinsson. There he remained fourteen years, until Hall's death at the age of ninety-four. In the latter part of his life Ari recorded in writing those traditions he considered of most importance. The themes of these recorded traditions are well established. They are the early history of Iceland and the lives of Norwegian Kings.

* Saemund the wise (1056 to 1133) also wrote a brief kings' book containing lives of the Kings of Norway from 850 to 1047, but whether in Latin or Icelandic we do not know. It has not survived.

How much of Ari's work still survives, in its original form, is disputed. But the most careful scholarship clearly and fully demonstrates that, upon Ari's investigations and recorded conclusions respecting that early period, rests the superstructure of all subsequent historical work done in Iceland. Ari is frequently quoted in the Sagas, notably in the lives of the kings, and always with the deference willingly paid to one whose knowledge of that whereof he speaks, historical discernment and honesty have never been impeached.

One work unquestionably remains, as it came from Ari's hands. This brief treatise, or summary of a few thousand words, is called Íslendínga-bók, the book of the Icelanders. The scrupulous care of Ari to state only the truth and, if perchance he has unwittingly erred (he recognizes his errancy), his desire that the reader should know the sources of his information and better the recorded facts and conclusions, where betterment is possible, disclose a man in whose simple wisdom and truthfulness we can trust as in those of the fewest among all historians. Ari, the historian, never wittingly deceives. His style is bare, simple, direct; disclosing the priest and friend of books, not the story teller and frequenter of feasts.

His fosterfather, Hall, was baptized, when a child (998), by the missionary Thángbrand, and he remembered that incident. His uncle Thorkel had talked with a companion of Erik the Red, the first settler of Greenland (986). There were witnesses living who could verify, through their own observation, or through what they had been taught by their immediate ancestors or others, the truthfulness of a great portion of those re-

cords, which tradition was bearing downward and Ari desired to sift and record. Much of the honor and service of the past belonged to his own family record.

The author of the Heimskringla points out how favored Ari's position was, in touch with the far past, through old and wise men, who recalled what they had learned from sages of preceding generations. He shows also how trustworthy and manifold were the sources of Ari's information. Of Ari himself he says: "He was eager to learn, of retentive memory, and truthful of speech."

Such is the agreeing testimony borne to their elder brother by all the scribes and historians of the Icelandic commonwealth. The work of Ari is preserved, at least in part, and we venture to affirm that no candid mind will ever turn from the pages of the Íslendínga-bók without assenting to the judgment of those historians and Saga writers his countrymen, who were separated from him by only one, or at most, by a few generations.

Icelandic scholars * believe that Ari's example found speedily imitators among those skilled in writing, but the sagas themselves are silent upon this point. Nevertheless, though the dates of the written records and the names of the scribes are as a rule omitted, the oral freshness of the best sagas and their freedom from all alloy of Romance † influence bear witness to their early passing from oral to written tradition.

The Icelandic Saga literature contains thus the re-

---

* Maurer. Island, page 459. "From now on (two decades after Ari's death) there was a rapid forward movement in Icelandic literature."

† First Romantic Sagas date from the reign of King Hákon Hákonsson (1217 to 1263).

corded oral traditions of an earlier period. Those who repeated the tales, the saga men, claimed to be truthful narrators. The race, to which actor, story-teller and listener belonged, was distinguished by its jealous pride of ancestry and, during the early, the golden Saga age, closing with about 1250,—by its love of historical and national, as opposed to romantic and foreign themes.

A simple-hearted priest, loving truth and anxious to guard against forgetfulness or change the most important memories of his fatherland, arrested in the first half of the twelfth century the oral tradition, and inaugurated the age of writing.

We have, I think, every reason to believe that, under the influence of Ari's example, all the more important Sagas were committed to writing before the close of the thirteenth century.

This literature, part history, part myth, folk tale and imaginative writing, has been preserved for us in parchments of the thirteenth and following centuries. These codices are largely compilations of many distinct Sagas and apparently point, as Vigfusson surmised,* to an earlier generation of brief vellums whereof these are transcripts. The bulk of these codices belongs to the fourteenth century; in the fifteenth their numbers dwindle away, disappearing in the sixteenth. Thus, of the Njála, the most copied and popular of all the national Sagas, we have among codices and remnants of codices, one MS. of the thirteenth century, ten of the fourteenth, three of the fifteenth and one of the sixteenth.

*Vigfusson. Sturlunga Saga. Vol. 1. Prolegomena CLV.

But the physical conditions of Iceland were unfavorable to the conservation of these records. Volcanic upheavals and the dampness and grime of the farmhouses conspired with that neglect and ignorance of the old literature, which prevailed for a time prior to the revival of learning in the seventeenth century, to consume and destroy the old parchments. It is indeed surprising that so much has survived the wasting of time and the neglect of man.

With the revival of learning, however, the interest in the old was reawakened; men began zealously collecting the parchments, and scribes multiplied them through paper copies. Of Arni Magnusson (1663 to 1730), the greatest of these collectors, Vigfusson says, "It is difficult to overrate the services which Arni rendered to Northern literature. But for him, the bulk of the works, which form its chief glory, would have perished slowly but surely." In the great fire of Copenhagen in 1728, which destroyed the university library, a number of Icelandic parchments perished, including some of those collected by Arni.

The Sagas, that contain references to the Vinland voyages, are mainly those, that are classed among the historical Sagas; that is, those whose intent is to record solely the history of the fatherland or the lives of Norwegian kings, such as the works of Ari and his continuators and those attributed to Snorri Sturlason. But the most interesting portion of the Saga literature, from the standpoint of art and nationality, is that devoted to the lives of the patriarchs. Here the mythical element enters more largely. The best Sagas of this class, *e. g.*, Njála and Laxdaela, are rewritings of the

earlier traditions, and distinctly literary creations, wherein the actual experiences of the heroes furnish the substance, the theme; but the hero-worship of the multitude and the artist's fancy have added, subtracted, changed, with a certain historical sobriety and yet with a large degree of license. References to the Vinland voyages are found in Sagas of this class; *e.g.*, Eyrbyggja.

Streams of diverging oral tradition often proceed from a common source, a single remote event or experience. We meet thus in the Icelandic Saga, as in all literatures, with distinct tales that report concerning the same historical occurrences, with essential agreement as regards the core of the matter, but wide divergence in the externals. In Iceland, furthermore, during the age of writing, the old Sagas were frequently re-edited, *e. g.*, Gisla Saga, Bandamanna Saga. The new editor strove not only to render the style smoother, but also to heighten the interest, through insertions from other sources and even inventions. Thus, owing in part to universal, in part probably also to local causes, we find in Iceland a dual Vinland tradition.

We are now in a position to examine intelligently the value of these Northern records, touching the alleged western voyages of discovery and attempted colonization.

Ari's Íslendínga-Bók contains the earliest record. The oldest manuscripts of this work are two paper copies of a lost parchment. Both are attributed to Jón Erlendsson,* a clerical scribe of the seventeenth century.

* A scribe of Brynjólf, Bishop of Skálaholt (1639 to 1675). After the Bishop's death, 1675, his library of Icelandic MSS. was scattered. When Arni Magnusson was collecting in Iceland (1702 to 1712) the Islendínga vellum could not be found, It is known to have been in existence in 1650 and was perhaps written by Ari himself. Vigfusson assigns date of about 1150 to this lost vellum.

The essential agreement of these paper copies with their original is not questioned.

In the sixth chapter of the Íslendínga we read, "That land, which is called Greenland, was found and colonized from Iceland. Erik the Red is the name of a Broadfirth man, who went out thither from here and took there land, where it is since called Eriksfirth. He gave name to the land and called it Greenland and said that it would make men eager to go thither, if the land had a good name. They found there the dwellings of men, both east and west in the land, and fragments of boats (cobles) and stone implements; wherefrom it may be concluded that kind of people had been there, who occupied Vinland and the Greenlanders called Skraelings. But it was, when he began to occupy the land, fourteen or fifteen winters before Christianity came here to Iceland (1000), according to that, which he, who himself accompanied Erik the Red out, told Thorkel Gellisson in Greenland."

This work is believed to have been composed about 1134. Ari's information concerning Vinland (to judge from the context) derived through his Uncle Thorkel from a companion of Erik the Red.

The point, however, which Thorkel's authority supports, is the date of Greenland's discovery. Vinland is only mentioned in passing and in order to exhibit more clearly the character of the probable aborigines of Greenland.

The plain inference is that Ari regarded the tradition of the Vinland voyages as too well known and credited to demand here explanation or confirmation. The theme was for a time alien to his purpose. He may indeed

have treated it at length in some other work lost to us, but employed as material by later historians.

The Landnáma Saga, the story of the settlement of Iceland (justly attributed in its earlier form to Ari and in part to his contemporary Kolskegg) and the Kristni Saga, the story of the introduction of Christianity (for which Ari's collections are believed to have furnished the basis) contain similar though fuller statements. The historical value of these works is unquestioned. They are the sources of our knowledge of early Icelandic history. Detached leaves of a fourteenth century vellum (Hauksbók) that originally contained both these works exist, but the best texts are found in paper copies owed to Jón Erlendsson. The most complete statement is that of the Kristni Saga (eleventh chapter): "That summer King Ólaf Tryggvason went South out of the land to Windland (Land of the Wends). He sent also at that time Leif Erikson to Greenland to proclaim the faith there. Then Leif found Vinland the Good; he found also men on a wreck at sea; on that account, he was called Leif the Lucky." The Landnáma-Bók mentions also Karlsefni as one who found Vinland the Good.

The theme of the Vinland voyages is foreign both to the purpose of Landnáma and also to that of the Kristni Saga. The references are therefore of a similar character to that found in the Íslendínga-Bók, though more explicit. The inference as to the universal diffusion and acceptance of the tradition is identical.

Similar, though more extended, notices of the Vinland voyages are contained in the lives of the kings of Norway. There are many codices wherein the rec-

ords of early Norse history are inscribed. The lives of the kings are given, at times in an abbreviated, at times in an expanded, form, as we should expect. The period covered by the reign of Ólaf Tryggvason (995 to 1000) corresponds to the era of the first Vinland voyages.

Some unknown author of Iceland's golden age composed a work, containing the lives of Ólaf Tryggvason, Saint Ólaf and other Norse kings, which is admitted to be a masterpiece of historical and literary workmanship. This unknown historian is believed to be Snorri Sturlason, the author of the prose Edda, who flourished between 1178 and 1241. As poet, scholar and statesman, in wealth and political influence, he stood foremost among his contemporaries.* Snorri, if the anonymous Icelandic historian be Snorri, accepted without question Ari's statements regarding the earlier period. Concerning the historical worth of these Kings' Sagas, Konrad Maurer, than whom there is no greater authority in this field, says: "Upon the sagas, of Ólaf Tryggvason and of Saint Ólaf, the history of the North for the tenth and eleventh centuries is unhesitatingly based." This work has come down to us in varying forms. Vigfusson believed that the fuller forms represent the original work of Snorri, the briefer later abridgements.†

---

*See Schweitzer: Geschichte der Scandinavischen Literatur., Vol. 1., page, 202.

†Among the most important codices, containing in whole or in part the lives attributed to Snorri, are:

1st. Fris-Bók (assigned by Vigfusson to circa 1270, by Unger and Storm to the beginning of the fourteenth century).

2d. Kringla, basis of Heimskringla, Unger: Christiania, 1868.

We read in the 231st chapter of the Great Ólaf Tryggvason's Saga: "That same spring (1000) Ólaf sent Gizur and Hjalti to Iceland, as is before written. Then the king sent also Leif Erikson to Greenland to proclaim Christianity there. The king gave him a priest and some other consecrated men to baptize the folk there and make known to them the true faith. Leif went that summer to Greenland; he took in the sea a crew of men, who were disabled and lay on the wreck of a ship, broken to pieces, and, in that same voyage, he found Vinland the Good and came, at the close of that summer, to Greenland and went to dwell in Brattahlith at the home of Erik his father. Men called him thereafter Leif the Lucky, but Erik his father said the two things balanced each other, that Erik had rescued and given life to a ship's crew and that he had brought a juggler to Iceland; so he called the priest."

It is not our intention to present here all the testimony borne by Icelandic Saga-writers, annalists and geographers to the veracity of the Vinland record. Reeves, in "The Finding of Wineland the Good," * has placed within the reach of every English reader an accurate rendering of all the notices thereof, that can be culled from old Norse literature.

3d. Jofra-Skinna.

The originals perished in the Copenhagen fire. The two codices are ascribed by Vigfusson respectively to 1256 and 1270; by Unger to the first half of the twelfth century. Paper copies are extant.

4th. Arna Magnaean Codex 61 (ascribed by Vigfusson to circa 1350, by others (Reeves) to 1400). Basis of Great Ólaf Tryggvason Saga. Formanna Sögur: Copenhagen, 1825.

The Heimskringla account, page 204, and that of Frisbók (Reeves, page 14) are almost identical with that of great O. T. Saga.

* London, Henry Frowde, 1890.

The statements of Ari and of the Kings' Sagas exhibit the general character of the briefer records. The evidence deriving therefrom is this. A series of many manuscripts, dating back at least to 1300, accords in representing the tradition of western voyages as unquestionably accepted in Iceland. These codices contain (or contained, for some have perished), among other themes, historical works, attributed with some hesitation to Snorri (1178 to 1241), but without any whatsoever to Ari. The according testimony of all Icelandic Sagas is that Ari's statements were accepted as conclusive.

Either then Bishop Brynjólf and his scribe forged the Íslendínga-bók and have successfully deceived all Icelandic scholars for two centuries; either all Icelandic scribes of the age of writing (beginning with circa 1130), in whose works allusions are found to the Vinland voyages, were clever charlatans, or themselves befooled; or the Íslendínga-bók and its substantiation of the Vinland record are genuine and, from Ari's time downward (circa 1100), that tradition was accepted without a dissenting voice. But Ari's uncle, Thorkel, had talked with a companion of Erik the Red, father of Leif, the reputed discoverer of Vinland; and this brings us back by two links of evidence, Thorkel and Erik's companion, to the actual discoverer of America, or what is the same, to his father.

The story had already before Ari's time reached the court of Denmark. Master Adam of Bremen, in his "Descriptio Insularum Aquilonis," written about 1070, says: "Moreover he (the King) spoke of an island in that ocean, discovered by many, which is called

Wineland (Vinland), for the reason that vines grow wild there which yield the best of wine. Moreover, that grain unsown grows there abundantly is not a fabulous fancy but, from the accounts of the Danes, we know to be a fact." This work was written about the time of Ari's birth. Master Adam's informants were the King, Svend Estridsson, and other Danes.

Two versions of the Vinland voyages exist, both handed down in detailed records. These records have often been called log books and with considerable justice. The two versions differ, but not in such a degree as to invalidate at all the historical value of the tradition. We hold with Maurer, Storm, and (we believe) Vigfusson, that the version contained in the Sagas of Erik the Red,* and of Thorfin Karlsefni,† represents the earlier and more loyal tradition. These two Sagas contain almost identical statements. Maurer says of the Thorfin's Saga: "It is almost as trustworthy as the Sagas of Ólaf Tryggvason or of Saint Ólaf."

A second version is contained in that immense codex, found in the Island of Flatey in the west of Iceland, and known as the Flateyjar-bók."‡ Reeves' Wineland the Good gives accurate translations and photographic reproductions of all three Sagas.

The second version serves to correct and supplement the first, and the two, combined and harmonized, give a description of portions of the West Atlantic coast, which will be found to correspond with surprising exactitude to then existing conditions. Naturally, in the

* Codex circa 1400, Vigfusson.

† Hauks bók 1310, Vigfusson, 1305–34, Maurer, not later than 1334, Reeves.

‡ Codex finished 1380, Vigfusson, 1387, Storm.

absence of compass or any accurate means of measuring distance, with the imagination excited by new scenes and experiences, the initial record would be far from accurate. The oral tradition, ruling for 150 to 200 years, perhaps longer, would thereafter naturally transform and expand the Saga; for the theme was a novel one, the experiences strange, stirring. We must not demand therefore inerrancy of the Vinland Saga. Nor, on the other hand, must we be surprised if, as is claimed, no authentic traces of the Norsemen's visit have as yet been discovered. The tradition, we accept as genuine, claims only a residence of three winters, divided between two places, Stream-firth and Hop.

That all traces of such a settlement should disappear in nine centuries is precisely what we would expect. Iceland, where Norsemen have dwelt continuously since about 900, has, so far as we are aware, no runic inscriptions as records of her past; Shetland and the Orkneys, which were occupied before Iceland, only the runic scratchings in the Maeshowe.* The art of rune carving was in the year 1000 known only to the fewest. With what justice then can we demand of the short-lived Vinland settlement runic inscriptions, or any other archæological remains, as indispensable vouchers of the truthfulness of the old Norse records?

Where, we ask then, is the flaw in this chain of evidence: unless indeed all testimony be worthless that is not given by eye-witnesses and at once recorded in writing?

---

* See BULLETIN June 30, 1891—Orkney and Shetland.

The tradition accords with natural conditions and the Norseman's habits of life and indwelling qualities. It was universally accepted in Iceland, certainly from at least 1100. A generation before that period Master Adam had learned thereof at the Court of Denmark, as of an undoubted fact. The spirit of the Icelandic traditions was historical rather than imaginative. Ari found this tradition current with others. His temper was that of the most careful, conscientious scribe; his work is the primer of Icelandic history and its statements of facts unassailable. The means at his disposal for determining the value of this particular statement were abundant. The alleged voyages occurred about the year 1000 to 1006, some sixty years only before his birth.

His uncle, Thorkel, had talked with a companion of Erik the Red, and thus that gap back to 1000 was bridged. Emigrants from Iceland had taken part in the second voyage, 1003 to 1006, and the local Sagas (Eyrbyggja) indicate that the story of their experiences had been brought back independently to their own homes.

Either some Greenlanders possessed marvellous powers of imagination and persuasion, portraying as real that which actually existed in the West Atlantic, though they knew it not, and persuading all their fellow Norsemen of their veracity, and Icelandic annalists have conspired with them, inserting false entries about Vinland and Markland against the years 1127 * and

* 1127. "Bishop Erik of Greenland went in search of Vinland."

1347,* or the record is genuine and Helluland, Markland and Vinland not myths, but parts of a discovered Western Continent.

No Icelandic scholar of repute, so far as we are aware, questions for an instant the general truthfulness of this record.

We therefore affirm unhesitatingly that, about the year 1000, some portions of the eastern American coast were discovered by Norsemen and an attempt was made to colonize them.

---

* 1347. "There came also a ship from Greenland, less in size than small Icelandic trading vessels. . . . There were 17 men on board, and they had sailed to Markland, but had afterwards been driven hither by storms at sea." (Reeves' Wineland, page 83.) This record of 1347 is the last historical mention of a voyage made by Norsemen to the Western lands. (MS. supposed to have been written about 1362.)

THE NORTH GREENLAND EXPEDITION OF 1891–92.

AN ADDRESS BY

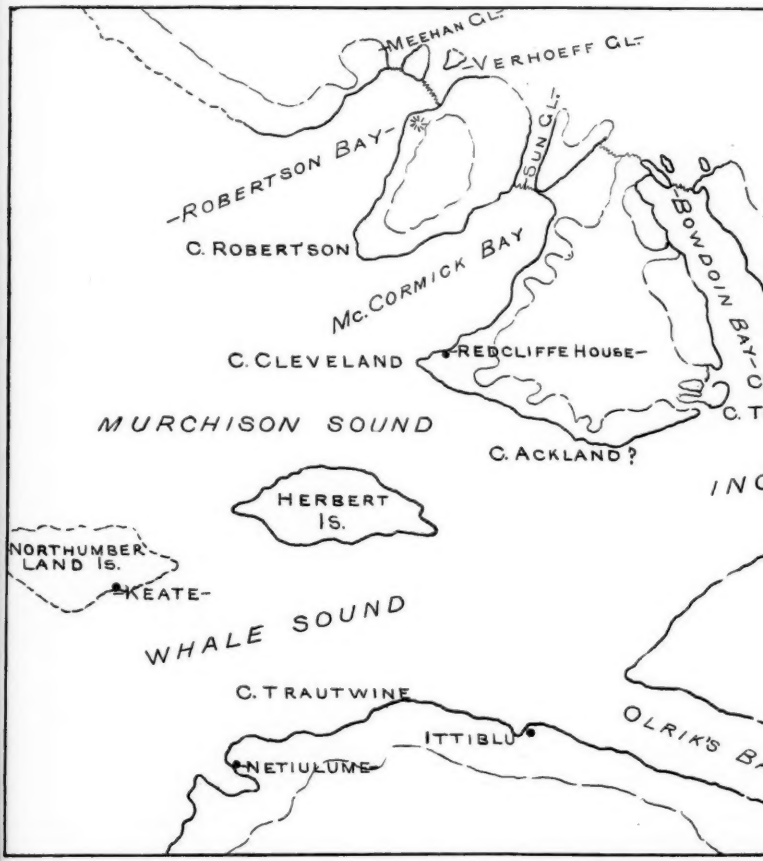
CIVIL ENGINEER R. E. PEARY, U. S. N.

Ladies and Gentlemen, Members of the American Geographical Society: It is with mingled feelings of pleasure and pain that I come before you again to-night. Pleasure that the Society's tangible interest in, and endorsement of, my untried plans two years ago has been justified by the successful execution of those plans. Pain that one who sat beside me upon this platform upon the occasion of my last address is no longer with us. I refer to Gen. Cullum.

I remember so well when, just before sailing, I called upon him to say good-bye, he took my hand as I was leaving and said, "Peary, good-bye, I wish you all success, but when you come back, I shall be over in Greenwood." I laughed at him and told him he was good for more years than that, but his words were prophetic. When I returned, I found him over in Greenwood.

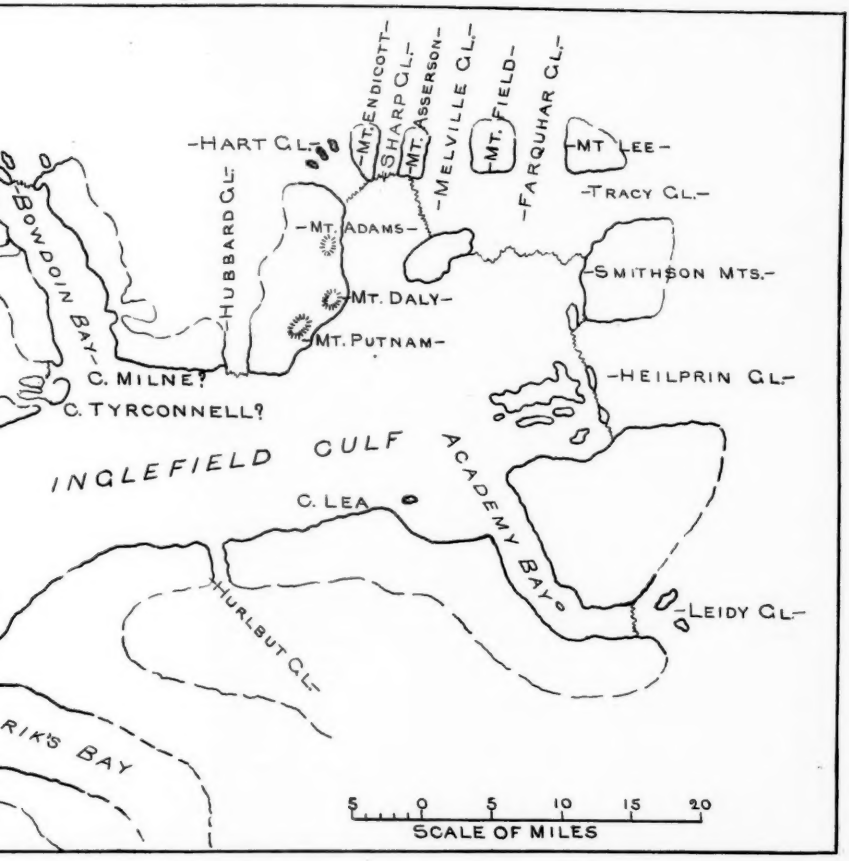
In order not to take up time with old material, I will refer those not present at my last talk, to the Society's BULLETIN of July, 1891, for the full prospectus of my expedition.

In a sentence, the principal object of the expedition was the determination of the northern limit of Green-



MAP OF WHALE SOUND

Showing additions made by the North Greenland Expedition of 1891–92. Th
the south side from the head of the Gulf to Olrik's Bay, is from the recent survey. A



E SOUND AND INGLEFIELD GULF.

891–92. The shore line of the entire north side of Whale Sound and Inglefield Gulf, as well as
nt survey. All new names are indicated by a dash before and after, thus—MT. DALY—.

land, and its fundamental feature was the utilization of the surface of the interior ice cap as the highway to the objective point. The one recognized in the project was the coextension of the land and ice cap northward, and the alternative proposed, in case the ice should be found to cease at a low latitude, was to follow its northern edge to the unknown east coast.

As a matter of fact the ice cap and the main land mass were both found to terminate at a lower latitude than I had expected, smaller detached land masses extending northward indefinitely; and then I followed the northern limit of the ice to the east coast.

The little steam sealer Kite moved out of her Brooklyn dock at 5 P.M., June 6, 1891, and steamed up the East River amid the general salutes of the shipping. Stopping at Sydney, Cape Breton, to coal, thence passing through the straits of Belle Isle, where she was delayed several days by the ice, she arrived at Godhavn, Greenland, on the morning of the 27th. Here the expedition remained for two days and then steamed away for Upernavik, which was reached early in the morning of the 1st of July. The next morning we were at the Duck Islands, where a supply of ducks was laid in, and the following night we got under way for the passage of Melville Bay. Up to this time no ice had been met since leaving the straits. By midnight our further progress was arrested by the ice, and not until July 23d did the Kite get free from it off Conical Rock.

On the 11th of July I had the misfortune to have both bones of my right leg broken just above the ankle, by a blow from the iron tiller, while the Kite was ramming her way through the ice; and from that time until

July 27th, when I was carried ashore at McCormick Bay, I lay on my back in the cabin.

Early Saturday morning, July 25th, after a futile effort to force a passage into the ice which still stretched unbroken across Inglefield Gulf, the Kite swung around into McCormick Bay, on the north side of Omenak or Murchison Sound, and two boat parties were immediately sent out to reconnoitre the shores of the bay for a house site. This was soon selected, and the work of erecting the house commenced at once.

Fortunately, all the frames had been cut and fitted while we were fast in the ice, before the accident to my leg, and the remainder of the work was comparatively simple.

On the afternoon of the 27th I was transferred to my tent on shore, close to the house, where I could supervise the work. Two days later, on the 29th of July, all my supplies having been landed, I turned the Kite over to Prof. Heilprin, and early the next morning (Thursday) she steamed south.

During this time the crew of the Kite and Prof. Heilprin's party rendered my party much assistance in the work on the house.

Saturday the roof was completed, and I was carried in to escape a furious storm of wind and rain.

Tidal and meteorological observations were commenced at once.

On the 12th of August, my house being completed as to the exterior, I sent Gibson, Dr. Cook, Verhoeff and Astrup in the *Faith*, Gibson in command, with instructions to go to the great loomeries of Hakluyt Island and obtain a supply of birds for our winter use; then

to search the shores of Herbert and Northumberland for natives, and bring me back a hunter and his family. If no natives were found here, Gibson was to cross Whale Sound to the settlement of Nettiulume.

In six days the party returned, Gibson having successfully carried out all my instructions.

The construction of a winter stone wall about the house was then commenced, the work on this being varied by seal, deer and walrus hunts, and reconnoissances of the neighboring ice caps by Astrup on his ski.

Between September 7th and 30th two attempts were made, first by Astrup, Gibson and Verhoeff, then by Astrup and Gibson, to carry out my plan of establishing an autumn advance depot of supplies across Prudhoe Island at the southeast angle of the Humboldt Glacier.

In the last attempt the boys penetrated an estimated distance of thirty miles, when they were stopped by the condition of the snow.

During their absence, I was moving from place to place in my whale boat after deer, Matt and Ikwa, my native hunter, bagging fifteen. After the return of the boys from the inland ice, a hunting party was kept almost continuously in the field until the middle of November, when the score amounted to thirty-one.

By this time the long winter night was upon us, and we settled down in comfort and security, to pass lightly through it.

Constant occupation, first in the little fittings about home, then in the construction of ski and sledges, varied by daily exercise, the visits of the natives, and the pleasant breaks of Thanksgiving and the Christ-

mas holidays, congenial companionship and the best of food, carried us quickly through the sombre darkness.

The returning sun in the middle of February found us a company of athletes, in need of training to be sure, but in the best of condition and eager for some arduous effort. This event was also the signal for increased activity in the preparation of the equipment for the long journey.

Early in March hunting parties were again sent out, and added ten more deer to our stock.

On the 18th of April, accompanied by Mrs. Peary, Gibson and my native driver, I began a round of calls among my Eskimo neighbors, for the purpose of purchasing additional dogs and dog food, to be followed by a surveying tour of the unexplored recesses of Inglefield Gulf.

On the last day of April Dr. Cook, Gibson and Astrup, with five natives and eight dogs, started to the head of the bay to get the inland ice supplies up the bluffs.

May 3d I followed them with Matt and twelve dogs, leaving Verhoeff at Redcliffe to continue his meteorological and tidal observations, in which he had become intensely interested. Four days later Matt returned to Redcliffe.

A week of hardest work was consumed in transporting my supplies up hill and down hill, across the succession of great ice domes intervening between the shore and the edge of the true inland ice, fifteen miles distant.

On the 15th of May the actual start may be said to have been made.

REDCLIFFE HOUSE.

My course was northeast true, which, assuming the charts to be correct, should enable me to clear the heads of the Humboldt, Petermann and Sherard Osborn indentations.

Advancing on this course, much to my surprise, I found myself almost immediately over the divide, at an elevation of somewhat less than 5000 feet, and gradually descending toward the Humboldt Glacier Basin.

Hardly had I lost sight of the Whale Sound land before the distant peaks of the Rensselaer Harbour coast rose into view.

After a gradual descent to an elevation of about 3500 feet, the surface of the ice became nearly constant as to elevation across the Humboldt Glacier plateau.

On the 24th of May, at a distance of 130 miles from McCormick Bay, all my boys having volunteered to accompany me, I selected Astrup as my companion for the long journey, and Gibson and Cook returned to Redcliffe.

Two marches beyond this we began climbing again, and on the last day of June had passed out of the Humboldt depression, and from the plateau southeast of Petermann, at an elevation of 4200 feet, looked down upon the head of that Fjord and the great glacier discharging into it.

Still ascending, we reached the summit at an elevation of 5700 feet, June 5th, and then began descending into the St. George's and Sherard Osborn depressions. Unfortunately, the next two marches were made in cloudy weather, and I got too deeply into the depression and too near the centre of ice movement.

As a result, about ten days were lost in getting out again and back on to the crevasse-free level heights farther inland.

Again setting my course to the north and northeast, everything went smoothly for several days. We climbed gradually and easily over the highest divide we had yet encountered—something over 6000 feet in elevation—and were descending slightly towards the northeast, when, on the 26th of June, I was discouraged to see the land which had been occasionally visible to the northwest rise into view north and northeast.

Advancing a short distance farther, the entrance of a large Fjord came into view in the northwest, and soon after the land rose into view north and northeast, with the depression of the Fjord beyond it. I then deflected my course to the east, and soon found the land and the Fjord beyond it again confronting me; deflecting still more, this time to the southeast, I advanced until the first of July, when a broad break in the land beyond the Fjord was visible opening out to the northeast, and I immediately made for the land with the intention of reaching this opening. After reaching the inner edge of the land-ribbon where the inland ice came down against the slope of the mountains at an elevation of about 4000 feet, we were obliged to travel some twenty-five miles over the mountain crests and ridges before reaching a summit, which gave us an unobstructed outlook over the great bay stretching out to the northeastward. These twenty-five miles over a surface consisting of sharp rocks of all sizes were extremely trying to Astrup and myself. The fatigue of climbing with our heavy packs and hampered by the

dogs, which we were obliged to take with us, was greatly increased by the enervating effect of what was to us an almost tropical temperature, accustomed as we had been to the clear, cold, searching atmosphere of the inland ice. When, however, we reached at last the summit of the great bronzed cliff, some 3800 feet in height, guarding the head of the great bay, we forgot all our fatigue in the grandeur of the view before us. To our right across a great glacier rose other vertical bronze cliffs 4000 feet or more in sheer height, and ending in a wild promontory. Northward and northeastward stretched a bold bluff, red-brown line of shore, the nearest portion of it surmounted by an ice cap of limited extent, but the more distant portions free of all cresting ice cap and of snow. To our left lay the depression of the Fjord which had barred our passage, and still farther to the northward we could make out the entrance of a second Fjord, reaching apparently to the northwestward. At our feet beyond the great fan-shaped face of the glacier, which I estimated to be twenty miles in periphery, were scattered numerous icebergs, prisoned in the still unbroken surface of the bay ice. Beyond this the bay ice seemed perfectly smooth and unbroken, and stretched away uninterrupted to the distant white horizon of the northeastern Arctic Ocean. Far out in the centre of the bay I could make out a clouded appearance, undoubtedly due to the formation of water pools upon the surface of the ice, the first signs of approaching disintegration.

The bay itself I named, in honor of the day on which we first looked down upon it, Independence Bay. The great glacier at my right I called Academy Glacier,

and the giant cliff on which we stood, and upon which I afterward erected my cairn, I named Navy Cliff.

July 7th we were back at the edge of the inland ice, and on the 8th began our uneventful return journey.

During our traverse of this northern land I found flowers of numerous varieties blooming in abundance, conspicuous among them the ever present Arctic poppy. Snow-buntings, two or three sand pipers, a single gerfalcon and a pair of ravens were observed. Two bumblebees, several butterflies and innumerable flies were also noted. As for musk-oxen, their traces are to be found on every mountain and in every valley; without making any search whatever for them we saw about twenty, and all of these could have been obtained without the least difficulty.

Bearing more to the south into the interior, in order to avoid the obstacles near the coast, in four marches we were on the great central plateau, cloud-capped and deep with snow. Here, at an average elevation of about 8000 feet, we travelled for two weeks; then bearing to the westward, came down to the 5000 feet level east of the Humboldt Glacier, and thence parallel to the outward route to the head of McCormick Bay. Just before midnight of August 5th we met Prof. Heilprin and his party some ten miles from the edge of the ice, and early in the morning of Saturday the 6th we touched the shore of McCormick Bay.

A day or two after this, while the collections and material were being taken on board the Kite, occurred the single sad accident of the entire expedition. Verhoeff, who had gone on a geological trip, failed to return, and, fearing something might have happened to

him, an immediate search was instituted. During this search, prosecuted for seven days and nights by all the members of my party and Prof. Heilprin's, the Kite's crew, and nine Eskimo, the latter excited to the utmost by the promise of a rifle and a box of ammunition to the first who saw Verhoeff, the entire country between the place where Verhoeff was last seen and the Eskimo settlement which was his destination was carefully searched. The men fired guns at regular and frequent intervals, and shouted continuously. A knife and handkerchief lost by a party of hunters nearly a year previous were found, also minerals left by Verhoeff, and he was finally tracked to the edge of one of the large glaciers, where all further trace was lost, and after quartering the glacier in every direction we were forced to the painful conclusion that he had perished in one of the countless crevasses, and the search was therefore reluctantly abandoned.

The personnel of the expedition comprised in addition to Mrs. Peary and myself, Dr. F. A. Cook, Surgeon and Ethnologist; John M. Verhoeff, Mineralogist and Meteorologist; Langdon Gibson, Ornithologist; Eivind Astrup, Matthew Henson.

The elimination of the work of any one of these would have detracted very largely from the success of the expedition.

To Dr. Cook's care may be attributed the almost complete exemption of the party from even the mildest indispositions, and personally I owe much to his professional skill, and unruffled patience and coolness in an emergency. In addition to his work in his special ethnological field, in which he has obtained a large

mass of most valuable material concerning a practically unstudied tribe, he was always helpful and an indefatigable worker.

Verhoeff, besides contributing generously to the expense of the expedition, was devoted to his meteorological and tidal observations and made a complete and valuable series of both.

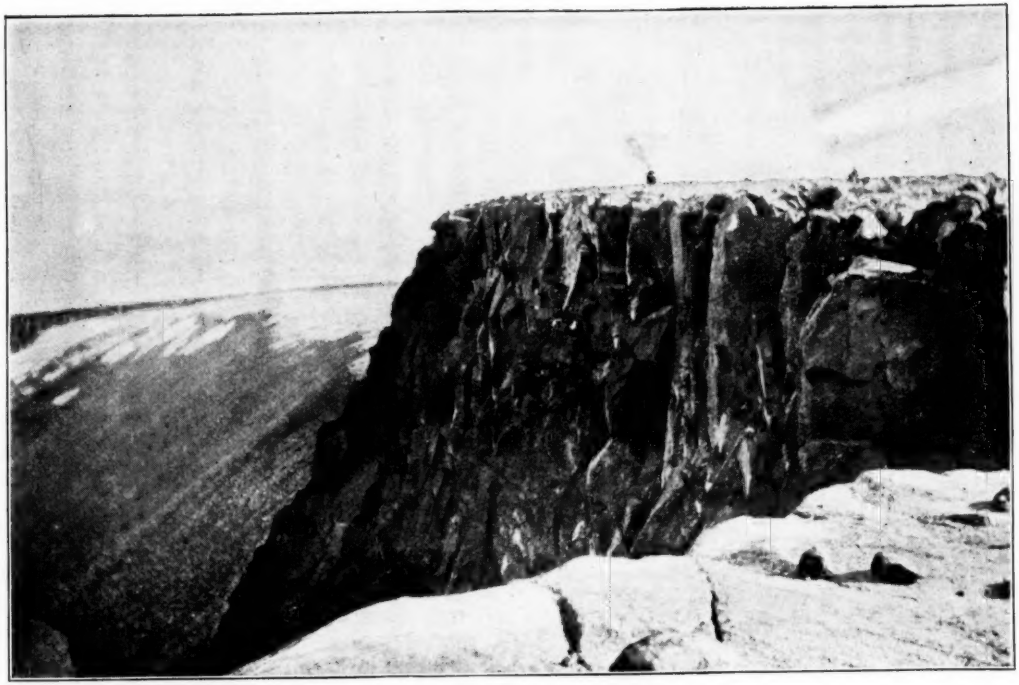
Gibson, a natural hunter, quick with rifle and gun, in addition to his ornithological work, contributed more largely than any other member of the party to our supply of game.

Astrup, a young Norwegian, a boy in years but a man in grit and endurance. was one among a thousand for the long and lonely journey during which he was my sole companion.

Henson, my faithful colored boy, a hard worker and apt at anything, being in turn cook, hunter, dog-driver, house-keeper and body guard, showed himself, in powers of endurance and ability to withstand cold, the equal of others in the party.

My acknowledgments of my obligations to the members of my party would be incomplete without reference to one who, though a member of the party, was in some sense not a member of the expedition, being on a somewhat different standing.

I refer to Mrs. Peary. Outside of the unspeakable comfort of her soothing presence in the time when at the threshold of a field of effort, in which pure brute physical fitness and strength are a *sine qua non*, I found myself a helpless cripple, I feel that I speak without prejudice when I say that to her womanly presence at all times and her valuable assistance and suggestions, especially in



NAVY CLIFF.

regard to our clothing outfit, the expedition owes much.

The experience of the expedition has proved conclusively to me the correctness of my theory as to the quality of the personnel of an Arctic expedition, namely, that it should be composed entirely of men of youth, perfect health and educated intelligence.

Such men, imbued with an interest in their work and the success of the expedition, able to lift themselves beyond the gloom and inactivity of the present, with plans for the work of the future, and possessing resources within themselves, are able to resist in a maximum degree the depressing and demoralizing effect of the long winter night, and in the field their ardor and *élan* more than balance their inexperience, or the toughened endurance of the working-man of a lower grade of intelligence.

Under the head of equipment I will touch upon but three important items possessing especial features of interest, and on which the comfort and health of the party and the successful execution of its work largely depended, viz. : house, travelling gear and clothing.

Our house, which was designed with a view to a minimum of weight and size with a maximum of comfort, was perhaps the most comfortable structure in which an Arctic expedition ever lived.

Floor timbers, posts and rafters were of one and one-quarter inch boards, ten inches wide, the former spaced one and one-half inch apart, the latter three inches.

The floor consisted of one and one-quarter inch yellow pine tongued and grooved.

The inside of the frames and rafters was covered with one-quarter-inch thick trunk boards, thirty-six by forty-four inches, and when these had been nailed in place the joints were carefully pasted over with thick brown paper, making an air-tight inner shell. Inside of the trunk boards, and kept one inch away from them by light battens, was a lining of heavy red blankets. On the outside of the frames was first a continuous layer, from the ground to the ridge, of heavy tarred paper, then an outside boarding of one inch tongued and grooved stuff, then a second layer of tarred paper with edges battened down. Windows were all double.

Four feet away from the exterior of the house and extending entirely around it, a wall of stone and turf helped out with barrels was built, until its top was some four feet below the eaves of the house.

All of my provisions, such as flour, corn meal, tea, sugar, coffee, biscuit, etc., which do not come originally in tin, were specially packed for me in rectangular tins containing twenty-five pounds net each, and two of these tins were packed in a substantial wooden case. These cases being all of nearly the same size, I removed the covers and then utilized them like blocks of stone to raise the wall some two feet higher.

The open side of the cases being placed inward they served both as a protection and a store-house; their contents being readily accessible from the corridor between the wall and the house.

From the top of the wall to the house extended a canvas roof, and after the snow came it was banked carefully against the wall, over the corridor roof and on the flat portion of the roof. The inmates of Red-

cliffe then had between them and the fury of the winter storms first a thickness of heavy blanketing, an inch air-space, then an air-tight shell of card-board, a ten-inch air-space, a thickness of tarred paper, an inch of boards, another thickness of tarred paper, a four feet air-space, from one and one-half inch to three inches of stone and turf wall, and from one inch to five inches of snow.

After this description it is not difficult to believe that the winter allowance of forty pounds of soft coal per twenty-four hours was never exceeded, and that the actual consumption was often as low as nineteen pounds.

The interior dimensions of the house were twenty-one feet by twelve feet, with seven feet height. This space was divided into two apartments, one seven and one half feet by twelve feet, occupied by Mrs. Peary and myself, the other thirteen feet by twelve feet, occupied by the rest of the party.

The ventilation of the house was effected, and the moisture of the atmosphere carried away, by an eight by ten air-shaft in each room, extending clear through the roof and covered by a board perforated with five two and one-half-inch holes.

These holes were open all the time, and in low temperatures the condensation from the warm air escaping through them was like heavy smoke.

Three times during the winter the floor was scraped, scrubbed thoroughly with soap and hot water, and then gone over with a weak solution of corrosive sublimate.

The three sledges used on the long trip were the survivors of a fleet of ten, comprising seven different styles. They consisted simply of two long, broad wooden run-

ners curved at both ends, with standards supporting light but strong cross bars. The larger sledge was thirteen feet long and two feet wide, with runners four inches wide and standards six inches high ; this sledge had no particle of metal in its construction, being composed entirely of wood, horn, and raw-hide lashings. It weighed forty-eight pounds, and carried easily a load of 1000 pounds.

After a two hundred and fifty mile trip round Inglefield Gulf, it made the long journey to the north and return to within two hundred miles of McCormick Bay, when it was abandoned for a lighter sledge.

The second sledge was eleven feet long by two feet wide, with three and one-half inch runners and six inch standards. It weighed 35 pounds, and carried a load of over five hundred pounds. As a result of imperfect lashing, it broke down on the upward trip and was abandoned.

The third sledge made by Astrup, was ten feet long by sixteen inches wide, with three-inch runners and two-inch standards ; it weighed 13 pounds, and carried a load of 400 pounds. This sledge made the round trip of 1300 miles, though carrying a load for only about eight hundred miles.

The result of this extended practical experience with sledges has been to show me that my previous ideas as to the great superiority of the toboggan type of sledge for inland ice work (ideas gained during my reconnoissance in 1886, east of Disco Bay) were erroneous, and that the sledge with broad runners and standards is *the* sledge. Also, that the wear upon the runners is practically nil, and that shoes of steel or ivory are not

CAIRN ON NAVY CLIFF.

only useless, but actually increase the tractive resistance.

Of even greater importance to our successful progress during the inland ice journey than our sledges were the "ski," or Norwegian snow-skates.

Valuable as are the Indian snow-shoes for Arctic work, the "ski" far surpass them in speed, ease of locomotion and reduced chances of chafing or straining the feet.

On the upward journey I alternated between the snow-shoes and the "ski," but while descending the northern ice slope, I had the misfortune to break one of the "ski," and on the return trip was obliged to use the snow-shoes only. Astrup used "ski" entirely from start to finish.

As regards clothing, I stated before my departure that nothing but the impervious integument of animal skin would keep out the searching wind of the inland ice. I am now satisfied that the only material for the clothing of men travelling upon inland ice is fur, and that the man who dispenses with it adds to the weight he has to carry, and compels himself to endure serious drafts upon his vitality, to say nothing of deliberately choosing discomfort instead of comfort.

The great objection urged against fur clothing is that, allowing the evaporation from the body no opportunity to escape, the clothing beneath it is saturated while the wearer is at work and then, when he ceases, he becomes thoroughly chilled.

This trouble is, in my opinion, due entirely to inexperience and ignorance of how to use the fur clothing.

It was a part of my plan to obtain the material for my

fur clothing and sleeping bags in the Whale Sound region, and I was entirely successful in so doing. My boys shot the deer, the skins were stretched and dried in Redcliffe, I devised and cut the patterns for the suits and sleeping bags, and the native women sewed them.

As a result of my study of the Eskimo clothing and its use, I adopted it almost *literatim*, and my complete wardrobe consisted of a hooded deer-skin coat weighing five and one-fourth pounds, a hooded seal-skin coat weighing two and one-half pounds, a pair of dog-skin knee trousers weighing three pounds nine ounces, seal-skin boots with woollen socks and fur soles, weighing two pounds, and an undershirt; total, about thirteen pounds.

With various combinations of this outfit, I could keep perfectly warm and yet not get into a perspiration, in temperatures from +40° F. to −50° F., whether at rest, or walking or pulling upon a sledge.

The deer-skin coat, with the trousers, foot-gear and undershirt weighed eleven and one-fourth pounds, or about the same as an ordinary winter business suit, including shoes, underwear, etc., but not the overcoat. In this costume, with the fur inside and the draw strings at waist, wrists, knees and face pulled tight, I have seated myself upon the great ice cap 4000 feet above the sea with the thermometer at −38°, the wind blowing so I could scarcely stand against it, and with back to the wind have eaten my lunch leisurely and in comfort; then stretching myself at full length for a few moments, have listened to the fierce hiss of the driving snow past me with the same pleasurable sensation that, seated be-

side the glowing grate, we listen to the roar of the rain upon the roof.

When it is remembered that my deer-skin coat was of the covering devised by nature to protect her tenderest creature in that very region, I may not be accused of exaggeration.

Our sleeping bags, also of the winter coat of the deer with the fur inside, were, I think, the lightest and warmest ever used.

They were made after a design of my own, and each member of the party was measured for his bag as he was for his coat.

In my own bag, weighing ten and one-fourth pounds, I have slept comfortably out upon the open snow, with no shelter whatever and the thermometer at −41° F., wearing inside the bag only under-garments.

During the inland ice journey, throughout which the temperature was never but a degree or two below zero, our sleeping bags were found to be an encumbrance and were thrown away, our fur clothing being ample protection for us when asleep, even though I carried no tent.

While the variety of food was not as great as it has been on some other expeditions, I doubt if any party ever had more healthy or nutritious fare.

A carefully studied feature of my project was the entire dependence upon the game of the Whale Sound region for my meat supply; and though I took an abundance of tea, coffee, sugar, milk, flour, corn-meal and evaporated fruits and vegetables, my canned meats were only sufficient to carry us over the period of installation, with a small supply for short sledge journeys.

In this respect, as in others, my plans were fortunate of fulfilment, and we were always well supplied with venison.

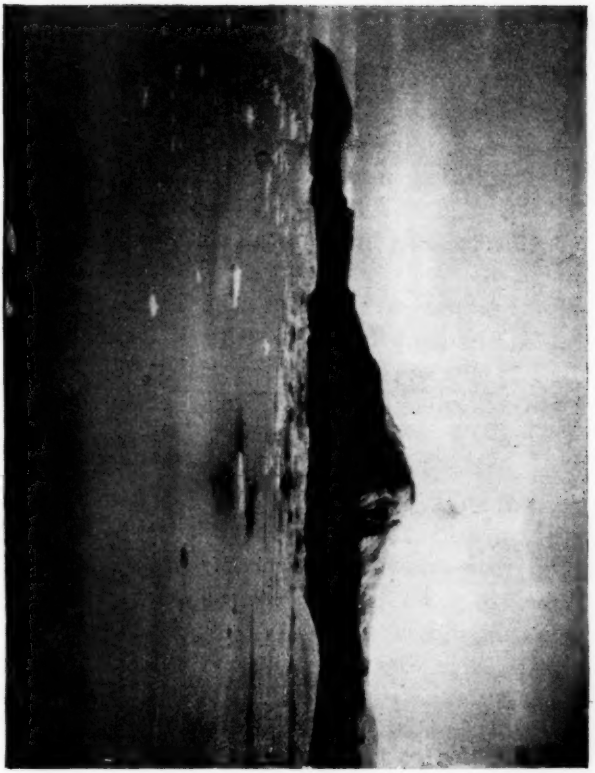
With fresh meat and fresh bread every day we could smile defiance at scurvy.

The accident to myself on the upward voyage, and my consequent incapacity for work during the season of 1891, was a serious blow to me, destroying, as it did, my opportunities for geographical work in the neighborhood of Redcliffe House, and, what I regretted most keenly, rendering it impossible to make velocity measurements of the extremely interesting glaciers of that region. Fortunately, the accident did not affect the long sledge journey, which was the main object of the expedition.

The principal geographical results of the expedition may be briefly summarized as follows:

The delineation of the unknown shores of Inglefield Gulf, and the imperfectly known shores of Whale and Murchison Sounds. The variance of existing charts from the real configuration of this region is so great that I found it difficult to locate satisfactorily the names appearing upon the charts. I have, however, retained all these names, and I think that in future there will be no difficulty in distinguishing them.

The most commanding summit of the entire region, a snow-capped peak of striking peculiarities, situated upon the northwest shore of the gulf, with an elevation of not less than 5500 feet, and possibly 6000, I have named in honor of the distinguished President of the Society, Mt. Daly. Nearly all the glaciers of this gulf are of the first magnitude, and are the peers of the



MT. DALY.

great ice streams of Jakobshavn, Tossukatek, and Great Kariak, in Disco Bay and Omenak Fjord.

2. The determination of the insularity of Greenland, and the delineation of the northern extension of the great interior ice cap, the main land mass.

3. The determination of the existence of detached ice-free land masses of less extent, to the northward.

4. The determination of the rapid convergence of the Greenland shores above the seventy-eighth parallel.

5. The determination of the relief of an exceptionally large area of the inland ice.

6. The discovery of a large number of glaciers of the first magnitude.

In the field of ethnology the last expedition can claim to be the first that has obtained complete and accurate information of the peculiar and isolated tribe of Arctic Highlanders. Dr. Cook has made a complete census of the little community of Smith Sound Eskimo, showing the relationship and approximate age of every man, woman and child in the tribe. The total, according to this census, is 233. He has also made anthropometrical measurements of seventy-five individuals, and with his assistance I have taken a complete series of photographs of the same individuals, comprising portrait, and front, side and rear elevations in the nude of each subject.

The meteorological and tidal observations by Mr. Verhoeff are among the most complete and painstaking ever made in the Arctic regions. An independent set of four hourly tidal and weather observations, kept by each officer of the watch, will prove of value in connection with the above.

As regards geographical methods during the traverse of the inland ice, my daily reckoning was kept by the compass, and an odometer wheel attached to the rear of the sledge. The circumference of this wheel being a trifle less than six feet one inch, one thousand revolutions of it made one nautical mile, and the revolutions were registered by the ordinary odometer mechanism.

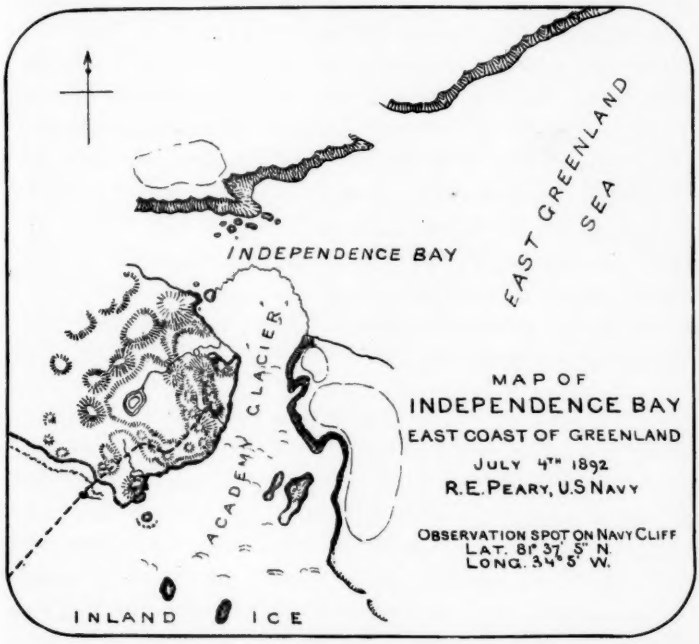
At four camps on the upward journey and three on the return, not including the observations at Navy Cliff overlooking Independence Bay, this daily reckoning was checked by a complete series of solar sights, taken with a small traveller's theodolite with a special vertical arc of large radius.

The time was obtained from two pocket chronometers and a high grade watch, all of which were carefully rated before my departure and after my return, and were compared with each other almost daily during the journey.

That these observations were not taken more frequently was due to the fact that, travelling as we did when the sun was north and sleeping when it was south, the taking of a set of observations meant for me either no sleep at all or, at best, but two or three hours of it. That even the field working of my sights was, however, not very far out of the way may be inferred from the fact that running on a compass course from my last observation camp, 150 miles northeast of McCormick Bay, and supposing myself to be ten miles to the eastward of my outward course, I found myself on reaching the head of McCormick Bay but five miles to the eastward; in other words, I was five miles out in my reckoning.

The freedom of the inland ice from all local attraction and the consequent reliability of the compass, if its constantly changing declination be carefully watched, is of great assistance to the traveller.

Elevations were determined by aneroids only, a



special boiling-point apparatus, which I had ordered for the purpose of checking the aneroid readings, having proved on trial to be perfectly worthless.

In conclusion permit me to say, while my recent expedition has been fortunate in most respects, and while the long sledge journey over the inland ice may perhaps lay

claim to be called unique in respect to the distance covered by two men without a cache from beginning to end, and in respect to the effectiveness with which those men were able to handle a large team of Eskimo dogs, it must be borne in mind that this was the first time that dogs had been used upon the inland ice, and that many of the methods and articles of equipment had to be devised especially for the novel conditions of the work. In fact, the art of travelling upon the inland ice is in its infancy, compared with travel over the sea ice along an Arctic shore line, and fruitful in results as has been the last expedition, it has been equally fruitful in practical experience and suggestions for future work which, with opportunity, may accomplish results far in advance of those already obtained.

Of these possible results I hope later to have the honor of speaking to you.

THE LANGUAGE OF THE MOSQUITO SHORE.

BY

WM. D. FARRINGTON.

The careful classification of languages made by modern philologists enables the student to determine at a glance the race relationships of any body of men having a distinctive tongue. And, conversely, the absence of any true signs of relationship argues either a separate origin or an absence of race purity. This is particularly true of the inhabitants of the Mosquito Coast of Central America. In this case the total lack of grammatical affiliation with any known family, and the strange resemblances of individual words to those of the same import in so many well-known languages of diverse origin, argue it a conglomerate of elements derived from various sources, but without any logical plan.

The study of the Mosquito tongue in its conception would be the study of one of the greatest struggles for supremacy that the world has ever known. It would be a study of the conflict between Spain and England, between the new Protestantism and the old Catholicism, between the policy of monopolies and free trade.

The theatre of this struggle was the Spanish Main; and the Mosquito Shore, with its almost endless series of lagoons and inland water-ways, communicating with each other, was the refuge of those bold men who followed the example of Sir Francis Drake in defying the power of Spain in all her glory. At first the refuge of men who fought for their country and religion, and later the stronghold of piratical scoundrels of all na-

tionalities, and of runaway slaves from Jamaica or the Spanish settlements, the Mosquito Shore became a plague spot that required stringent measures to eradicate.

And during these centuries of turmoil, what of the Mosquito Indian? Never very high in the scale of civilization, the constant intercourse with the lowest class of white sailors and, worse yet, the escaped slaves from Jamaica and the Spanish cities, degraded him still further, until at the present day a pure blooded Mosquito Indian is absolutely unknown.

The language has suffered in the same manner. What it was originally is not known. The only traces of the pre-Columbian tongue that remain would seem to indicate that it differed essentially from the language of the dominant races of the Mexican and Central American plateau, as represented by the modern Mayan, their direct descendant. It is probable that, even at that early period, the inhabitants of the Mosquito low lands were of the lowest caste.

At present the language differs wholly from that of the neighboring tribes, the Payas and Woolwas, so that they are unable to communicate except through interpreters; a fact which, with their different character and habits of life, would indicate that they are of entirely different stock. From their long intercourse with European sailors, they have incorporated many words of various European languages into their own. And the negro refugees from the mines and plantations have given them words and ideas, that find no relationship except on the Gold Coast. Using the original Indian as a basis, the language may be said to have

adopted and incorporated words from the English, Spanish, French, Dutch and African dialects, the proportions varying in the order named. The pronunciation of these foreign words would be absolutely unintelligible, were it not that we had a key in the pronunciation of English by the negroes and half-breeds of Jamaica and Belize. The *a* is always broadened and pronounced very flat; the *e* is shortened almost to a short *i*, and many changes are made that can be detected as exaggerations of the negro dialect of the Southern States.

The language is not wanting in euphony, although defective in grammatical powers. It has no article, definite or indefinite, the adjective *kumi* (one) supplying the place when it is necessary to denote number. Adjectives follow the noun and so, in many cases, do the numerals. Gender and number are wanting, all nouns being masculine, unless qualified by the word *mairen* (woman). There are twelve pronouns, of which the gender and number must be inferred from the connection. The verbs have mood and tense, the person being supplied by the addition of a suitable pronoun. They are wanting in number.

In this brief vocabulary the letters will have the value of the same letters in Spanish, except that *ai* is equivalent to the English *i*.

ENGLISH.	MOSQUITO.	ENGLISH.	MOSQUITO.
Man	Waikna	Husband	Maia
Woman	Mairen	Wife	Maia-mairen
Child	Lupia	Head	Lal
Boy	Tukta	My head	Laila
Girl	Kiki	Ears	Kiama
Father	Aize	Eyes	Naira
Mother	Yapte	Eyelids	Walmukra

ENGLISH.	MOSQUITO.	ENGLISH.	MOSQUITO.
Hair	Waltawa	Pork	Querko
Nose	Kakma	Banana	Sixa
Nostrils	Kakmahunta	Plaintain	Plati
Mouth	Bila	Corn	Aya
Lips	Walun	Cocoa	Duswa
Teeth	Walnapa	Limes	Limas
Hand	Mita	Fat-oil	Plolana
Nails	Walasmala	Cassava	Yaura
Tongue	Tushka	Bread	Tane
Foot	Mina	God	Proposquera
Stomach	Walia	Devil	Lassa
Chest	Walima	Witch doctor	Sukia
Breasts	Wal alika	Sun	Lapta
Arm	Walslaka	Moon	Kate
Leg	Walkumatara	Stars	Silma
Blood	Tala	Sky	Kasbrika
People	Hupla	Wind	Pasa
Chief	Nita	Thunder	Alwane
House	Watla	Earthquake	Niknik
Loin cloth	Palpura	Rain	Liawala
Woman's cloth	Qualunta	Clouds	Kasbrika walpa
Shirt	Prok	Land	Tasaba
Fish line	Kulawa	Sea	Kabo
Paddle	Quahi	River	Awala
Arrow	Trisba	Island	Dukwara
Pipe	Twak mi	Creek	Tingna
Tobacco	Twako	Cut off	Dukbun
Bow	Puntamuk	Fire	Pauta
Harpoon	Waiska	Water	Li
Spear	Silak	Day	Kakana
Gun	Rokbus	Night	Tama
Machete	Ispura	Morning	Taitan
Knife	Kisura	Evening	Tutmi
Hammock	Silmika	To-day	Naiwa
Blanket	Tuno	To-morrow	Yoka
Bed	Krikri	Week	Wik
Mosquito net	Kuah	Month	Kate
Calabash	Kahami-waukul	Dark	Tamatara
Bead	Lilora	Forest	Nutara
Hat	Sumeru	Savannah	Twi
Pot	Dikwa	Burial place	Rita
Spoon	Ispun	Path	Laka
Axe	Aisa	Ox-beef	Bip
Food	Plun	Calf	Bip lupia

ENGLISH.	MOSQUITO.	ENGLISH.	MOSQUITO.
Horse	Oras	Where	Anserasa
Hen	Kalila	Here	Naha
Chicken	Kalila lupia	Yes	Ao
Tiger	Limi	No	Apia
Deer	Sula	To	Wal
Wild hog	Wari	To eat	Piaia
Tapir	Tilbia (Indian, Dante)	To drink	Diaia
		To walk	Walpia
Peccary	Bexa	To run	Plapia
Rabbit	Kanki	To paddle	Kaubia
Rat	Martis	To sleep	Yapia
Bat	Sarkeuke	To go	Waia
Parrot	Rowhna	Going	Wakwia
Crow	Usis	Gone	Alsak
Crab	Kisenera	To speak	Aisaia
Iguana	Kakamuk	To hear	Walaia
Fish	Inska	To laugh	Kikia
Manatee	Palpa	To see	Kiki
Wild turkey	Quam	To possess	Walduxa
Curassow	Kusu	To bring	Bribal
Dog	Yul	To send	Lican
Monkey	Ruskika, waklin	To come	Bal
Alligator	Tura	Coming	Baliar
Stone (large)	Walpata	Get out !	Was
Stone (small)	Walpa	To seek	Ispush
Cotton	Wamuk	To ask	Macaba walia
Palm	Natak	To hunt	Antin
Cahoon palm	Kakatris	To give	Ora damnia
Cabbage palm	Siliko	To kill	Arakbusnika
Dwarf palm	Kuroso	To do	Munisna
Mahogany	Yulu	To dance	Pulilalauri
Bamboo	Kamero	To work	Wurk takisna
Paint	Orowa	To go back	Kiwaia
Thing	Dia	Come back	Clibalaia
Anything	Dukia	Procure for me	Bliss orika
I	Yung	Get	Orika
Thou	Man	I am going to be	Ya naha apir
He	Wetin	To be weary	Swapre
This	Baha	To stink	Bisbaia
That	Naha	Good	Aihoa
Other	Wala	Bad	Saura
What?	Dia	Sweet	Damne
When	Orkio	Bitter	Tapla
How many	Nakya	White	Pehine

ENGLISH.	MOSQUITO.
Lazy	Sileuwan
Quick	Pat
Big	Tara
Little	Silpi
More	Kara
Enough	Manis
Nothing	Apo
Sick (poor)	Sick
Finished (all gone)	Apuska
All	Puk
Yonder	Bukra
Sly	Koning
Young	Lupia
Warm	Bitnia
Well done	Atteny
True	Polly
Up	Ulia
Greeting	Nuxa
Good by	I'sabe
How are you?	Nuxa mani wasma
Where are you going?	Man ansera wia
Do you wish me to come back and help you?	Man yangra help clibalyal walsma?
I don't know	Yung kaikres
Not that one	Man piukan
Where do you come from?	Anserawia barun
My darling	Lainawilyo
All right	Polika
All wrong	Polika saura
I think so	Yungsingbun lukisa
All gone	Puk alsak
One	Kumi
Two	Wal
Three	Yumpa or niupa
Four	Wal-wal
Five	Matsip
Six	Matlalkabi
Seven	Matlalkabi pari kumi
Eight	Matlalkabi pari wal

ENGLISH.	MOSQUITO.
Nine	Matlalkabi pari yumpa
Ten	Matawalsip
Eleven	Matawalsip pari kumi
Twelve	Matawalsip pari wal
Thirteen	Matawalsip pari yumpa
Fourteen	Matawalsip pari wal-wal
Fifteen	Matawalsip pari matsip
Sixteen	Matawalsip pari matlalkabi
Seventeen	Matawalsip pari matlalkabi pari kumi
Eighteen	Matawalsip pari matlalkabi pari wal
Nineteen	Matawalsip pari matlalkabi pari yumpa
Twenty	Yawuneskakumi
Twenty-one	Yawuneskakumi pari kumi
Thirty	Yawuneska pari matawalsip
Forty	Yawuneska-wal
Fifty	Yawuneska-wal pari matawalsip
Sixty	Yawuneska-yumpa
Seventy	Yawuneska yumpa pari matawalsip
Eighty	Yawuneska-wal-wal
Ninety	Yawuneska-wal-wal pari matawalsip
One hundred	Yawuneska-matsip, or hundredkum

HARRISSE'S DISCOVERY OF NORTH AMERICA.*

BY

GEO. C. HURLBUT.

In the preface to this weighty volume Mr. Harrisse says (p. 7): "Proceeding thus with great prudence, we are nevertheless fully conscious of the uncertain and provisional character of our deductions. We know too well that a single name or a single date, unexpectedly disclosed, will often suffice to overthrow the most conscientious and systematic adjustment of thoughtful conclusions to well-investigated data. But we feel that something of permanent utility will have been achieved if we succeed in bringing into view the principal elements of knowledge which are accessible at the present time, and also in setting forth their literal meaning, their purport and their importance. This has been our sole aim, and this is the limit of our ambition."

The book is a monument of industry and research, and every scholar must feel a kind of personal obliga-

* The Discovery of North America. A Critical, Documentary and Historical Investigation, with an Essay on the Early Cartography of the New World, including Descriptions of Two Hundred and Fifty Maps or Globes existing or lost, constructed before the year 1536; to which are added a Chronology of One Hundred Voyages Westward, Projected, Attempted or Accomplished between 1431 and 1504; Biographical Accounts of the Three Hundred Pilots who first crossed the Atlantic, and a Copious List of the Original Names of American Regions, Caciqueships, Mountains, Islands, Capes, Gulfs, Rivers, Towns and Harbours. By Henry Harrisse. 4to. London and Paris, 1892.

tion to its author. Other documents, as yet unknown, will, no doubt, be brought to light in course of time to claim their place among those which Mr. Harrisse has so carefully arranged; but it is not too much to say that the order here established will not be seriously disturbed.

Part First deals with the voyages, from that of John Cabot in 1497 to that of Estevam Gomez in 1524–1525. In Part Second Mr. Harrisse describes the early cartography, the maps of Seville and St. Dié (which he prefers to call *St. Diey*), the Portuguese charts and the Lusitano-Germanic maps, of which he distinguishes five types. Part Third presents a catalogue of the oldest maps of America; Part Fourth, a chronology of voyages from 1431 to 1504; and Part Fifth, biographies of pilots and cartographers for the period 1492–1550. The Appendix contains the Wardens' Accounts of the Drapers' Company of London, March–April, 1521, concerning Sebastian Cabot, a Geographical Index and an Index of Names, and a list of Additions and Corrections. Mr. Harrisse does not call attention to a very important feature of his book, the great number of maps and charts, which elucidate the text.

The critical judgments recorded do not always command assent. Sebastian Cabot was not a model of probity, but Mr. Harrisse pursues him with a rancour that defeats itself. He considers the Wardens' Accounts, printed in the *Appendix*, decisive concerning Cabot's character, and he prints in italics the most significant lines. The Wardens and Company of drapers say:

. . . as perfite knowledge myght be had by credible reporte of maisters and mariners *naturally born within this Realm of England having experience, and exercised in and about the forsaid Iland*, etc., etc.

And we thynk it were to sore aventr to jopard v shipps with men & goods vnto the said Iland vppon the singuler trust of one man callyd as we vnderstond, Sebastyan, which Sebastyan as we here say was neu' in that land hymself, all if he maks reporte of many things as he hath hard his Father and other men speke in tymes past. . . . if the said Sebastyan had bene there . . .

These passages show very plainly the hatred of the London men for the foreigner, but as evidence against Cabot they amount to nothing.

Chapter VI. (pp. 26–38) is devoted to an examination of Sebastian Cabot's character. On p. 34 Mr. Harrisse expresses a decided opinion on the subject:

"Such proofs of constant mendacity and treason show that Sebastian Cabot was capable of swerving from the truth whenever it might profit him."

If they are proofs, they prove that the man was not to be trusted at any time; but on p. 43 Mr. Harrisse fortifies an argument by the testimony of Sebastian, and utters his mind in these words:

"True it is that assertions from Sebastian Cabot, particularly when calculated to enhance his merits in the eyes of others, must always be taken with a mental reservation; but, excepting his unfilial custom of ascribing to himself a credit which belonged to his father, we see no good reasons for rejecting his description in this instance."

After dismissing the Cabots and the Corte-Reals, Mr. Harrisse takes up the unknown navigators. In discussing the nomenclature of the Cantino map, he makes, on p. 88, the following quotation from Columbus, as reported by Las Casas:

"Dice: que desde el cabo de Cuba que se ve con la Española, que llamó Fin de Oriente, y por otro nombre Alpha et Omega, navegó hacia el Poniente: He says that from the Cape of Cuba, which is seen from Hispaniola, and which he called *The East-end*, and also by the other name of *Alpha and Omega*, he sailed northward."

The nature of his subject compels Mr. Harrisse to display on every page his familiarity with many tongues,

and he generally offers a translation, as a concession to the weakness of those who are unable to read the Latin, Spanish and other citations. There can be no doubt that he understands the original texts, but his translations are often little better than paraphrases, and sometimes, as in the passage just given, he laughs in the reader's face.

Columbus says that he sailed towards the *west* (navegó hacia el Poniente); Mr. Harrisse translates, "he sailed *northward*." *

A still more striking instance of respect for the literal meaning of an author occurs on p. 165, where the words of Bernal Diaz,

"Desde el rio de San Pedro y San Pablo y todo lo que descubriese,"

are translated as follows:

"All that which he might discover from the San Pedro and San Pablo river northwards."

The Spanish text says nothing of north or south, but only this, *from the river of San Pedro and San Pablo and all that he might discover.*

Mr. Harrisse places the San Pedro and San Pablo River on the Mexican Coast, south of Tampico, and interpolates the word *northwards* in the translation, because no discoveries were to be attempted south of that river.

He says on p. 169: "The Rio del Espíritu Santo is our Mississippi." Other writers agree with him in this opinion; but Mr. Walter B. Scaife, in the supplement to his work on the Geographical History of America,†

* This passage is corrected on p. 800.

† America: Its Geographical History, 1492–1892. Six lectures delivered to Graduate Students of the Johns Hopkins University. With a Supplement, en-

gives excellent reasons for identifying the Rio del Espíritu Santo with the Mobile River. Mr. Scaife quotes (in translation) the description of the river and country given by Navarrete (Viages y Desc., Tom. III., p. 65) in these words:

"They turned back and entered a river of very great volume, at the mouth of which there was a large town where they stayed more than forty days, repairing the ships and trading with the natives, in the most friendly and amicable manner. They travelled six leagues up the river and saw forty towns on the shores. This was called the province of Amichel: good land, quiet, healthy, well stored with provisions and fruits: its inhabitants wore many ornaments of gold in their noses and ears."

Mr. Scaife argues that the expression, "of very great volume," might be applied to a river much smaller than the Mississippi, and was, in fact, so applied by Cortés to the Pánuco, which we regard as a small stream. The statement that there was a large town at the mouth of the river is evidence against the Mississippi, for the land about the mouths of that river was practically uninhabited. Pineda is said to have ascended the river for six leagues and to have found forty towns on its banks; but, twenty-four years later, the remnant of De Soto's expedition apparently found no towns on the lower Mississippi. Moreover, the accounts of the soil, the healthy climate and the riches of the inhabitants, cannot be made to agree with the conditions of the Mississippi delta. On the map of 1520, reproduced in Winsor's Narrative and Critical History (Vol. II., p. 218), and on the great Weimar map of 1527, the Rio del Espíritu Santo is represented as flowing into a bay, wholly un-

titled, Was the Rio del Espíritu Santo of the Spanish Geographers the Mississippi? By Walter B. Scaife, Ph.D. (Vienna). Baltimore: Johns Hopkins Press. 1892. 8vo.

like any conception of the Mississippi mouth, within historical time.

The question is, perhaps, one of those which must remain without a decisive answer for every one but Mr. Harrisse.

In the chapter on Ayllon's First Voyage, Mr. Harrisse quotes nearly three columns from Peter Martyr, the sole origin, he says, of the narratives given by Gomara and Las Casas. He finds it necessary, therefore, "to reproduce literally Peter Martyr's own account." This account begins (p. 199) with the mention of a voyage undertaken by some Spaniards to the Bahama Islands (Lucayas) for the purpose of kidnapping the natives :

Cupiditate igitur habendi lucaios (Lucayans), etc. ;

which Mr. Harrisse renders, with manifest hesitation, as follows :

Prompted by the lust of possessing [?] the Lucayas, etc.

This conversion of slave-hunters into squatters hardly does justice to the author; and the rest of his text is treated with freedom. On p. 200, lines 28–34 of the Latin are condensed into three lines of English, and three lines of the Latin (34–37) are not translated, while in two places omissions are indicated in this literal reproduction.

On the same page there are six breaks in the English translation, and the following passage is represented by nothing in the Latin text :

"Sent us fifty of his followers loaded with products of the country."

On p. 201 there is one omission indicated in the Latin, and there are six in the English, and passages in

each language have nothing corresponding to them in the other. Text and translation fill only sixteen lines on p. 202, but in these there are two breaks in the Latin and three in the English, and two Latin passages are not translated.

On p. 233 Mr. Harrisse wrestles again with Peter Martyr, and confesses defeat by leaving the following sentence untranslated:

"Inanes huius boni hominis fore cogitatum exisitimaui (*sic*) ego semper et praeposui." . . .

This is helpless Latin, but why is Peter Martyr made to bear the responsibility for it?

The second part of the work, devoted to the early cartography of the New World, is creditable to Mr. Harrisse, who has given much time to the investigation of this division of his subject. He is disposed to think that the La Cosa map may be an authentic copy, rather than an autograph; and he refuses to believe that the Spanish Government made any effort to monopolize the construction of charts. On the contrary, he says,

"We are satisfied that map-making and the science of transatlantic navigation were freely taught at Seville, and that cartography was always an art openly inculcated in that city, as well as in Cadiz or Palos, without any interference on the part of the authorities."

Of the Canerio map, recently discovered by M. L. Gallois, of Lyons, in the *Archives du Service Hydrographique de la Marine* at Paris, Mr. Harrisse gives a detailed description on pp. 428–430. The map represents the world as known in 1502–1504 (to 1502, according to M. Gallois); it is well drawn, and measures 2.25 metres (7.38 feet) by 1.15 metres (3.77 feet). It is signed in the lower left-hand corner: *Opus Nicolay de Canerio Januensis.* Mr. Harrisse is of the opinion that

the map was made, or copied, by a Genoese cartographer in Portugal, because the legends are in Portuguese.*

There is a scale of latitudes extending from 75° N. to beyond 55° S.

Mr. Harrisse quotes in full what he calls the *precise text* of the two leading legends. One of these is over the West Indies, and this is exactly given according to the reproduction of the map by M. Gallois. The second legend is on the Brazilian coast, and Mr. Harrisse's text differs in a number of places from that of the reproduction. Leaving out the bracketed words, which Mr. Harrisse has added from the Cantino map, the two legends read as follows:

HARRISSE'S TEXT: BRAZILIAN COAST.

Auera crus chamada per nome aquall achou pedaluares cabral fidalgo da cassa del rey de portugall e uelle adescoiero por capitano do XIIII nauos que rey mandaua a caliqut ie nel caracho induto poi com esta terra aqual terra secrem esser terra foerme em aquel a muita gente de descricacam nuos omes e mulieres como quas mais os pario sum mais biancos.

THE GALLOIS REPRODUCTION: BRAZILIAN COAST.

A vera crus chamada per nome aquall achom pedalvares cabral fidalgo da cassa del rey de portugall e aelle adescobrio in dopor capitanio de XIIII navos que rey mandana a caliqut ie nel caracho induto poi com esta terra aqual terra fuerem esser terra fierme em a qual ha muita gente de descriva vam nuos omes e mulieres como quas mais os pario sum mais biancos.

Which of these two is the precise text? † The char-

* M. Gallois, for the very same reason, believes that the work was done in Italy. He says: "It is true that nearly all the nomenclature is in Portuguese; but the numerous mistakes which have crept into it seem to prove that the author was ignorant of the Portuguese tongue. He certainly copies in many cases without understanding. This map (*portulan*) must have been drawn in Italy, and very probably at Genoa, after one of those models brought from Portugal, to which the Italians at that time attached so high a value."—*Bulletin de la Société de Géographie de Lyon* (Mai-Juin, 1890, p. 101).

† The Atlas of Dr. K. Kretschmer's *Die Entdeckung Amerika's*, the magnificent work just published by the Berlin Geographical Society, follows the Gallois reading, but with variations. It has *e elle, mandaua, indoto, ferme*.

acter of the words in each supports M. Gallois in his conclusion that the map is the work of an Italian who did not understand Portuguese.

Mr. Harrisse makes a translation which seems to give the sense of the legend. The last two sentences of this translation read:

"They are rather white than dark, with smooth hair. The said land was discovered in the year [one thousand] five hundred."

The final word of the text is *biancos* (translated *white*), and Mr. Harrisse has drawn upon his inner consciousness for the words that follow.

Fidelity to his author is for some reason or other, distasteful to Mr. Harrisse, though he is severe upon those who are not exact. On p. 304 he quotes and translates as follows a passage from the *Orbis noua descriptio*, in the Ptolemy of 1508:

"Dixit, se navigasse ab Albionis australi parte, et tamdiu quo ad subparallelum ab subaequatore ad boream subgradum, 53 pervenit, et in eo parallelo navigasse ad ortus littora per angulum noctis atque plures insulas lustrasse, quarum inferius descriptionem assignabimus:—He said that he had sailed from the south of England, penetrated to 50° (*sic*) north latitude, navigated on that parallel west in the direction of the east, somewhat northwardly, and observed many islands."

Ruysch is here made to turn his back upon himself. He really said that he had reached 53°, north latitude, and had sailed on that parallel towards the lands of the Orient by way of the west. The words *somewhat northwardly* are of Mr. Harrisse's invention.

On p. 381, in Toscanelli's letter, the words,

"Ego autem quamvis cognoscam posse hoc ostendi per formam spericam (*sic*) vt est mundus, etc.,"

are translated:

"Although I know that it is a consequence of the spherical form of the earth, etc."

The correct rendering is: "Although I know that

this can be shown by a spherical body, such as is the world," etc.

On the other hand, there are times when Mr. Harrisse is literal to a fault. Toscanelli ends his letter with the conventional phrase *vale dilectisime*, which leaves the reader unmoved; but the translation, *good-bye, Dearest*, brings tears to the eyes.

On p. 432 a brief notice, headed *Juan de la Cosa*, tells of a reference "taken by Navarrete from the Muñoz collection of MSS., the only source of information, almost, used by Spanish savants to this day." There is room under the *almost* for Mr. Harrisse's works, and the savants may be comforted.

On p. 438 Mr. Harrisse describes, as if he had seen it, a map which Behaim must have made at some time between 1494 and 1507. If no such map is found, students may still enjoy the description, and compare it with that of Waldseemüller's lost map on p. 444.

On p. 457 Mr. Harrisse translates the same expression, *via del Norte*, occurring twice in five lines, in one instance *a north-western part*, in another *by the northern track*.

On p. 482, in a foot-note, is the following contribution to burlesque literature:

"We interpret Schöner's annotation near the West India islands by 'iste est imperfectionem,' or, 'that stands corrected.'"

In another place (p. 308) Mr. Harrisse has characterized Schöner as "that overrated Nuremberg cosmographer." It does not appear that he overrated himself, and certainly no cosmographer could have written three Latin words so devoid of meaning as those for which Mr. Harrisse has found an easy translation.

His own familiarity with other tongues breeds in Mr. Harrisse's mind indifference, if not contempt, for those readers who must depend upon his English versions. On p. 499 he quotes from Amoretti's *Pigafetta* a passage of four and a half lines, and translates only the less significant part, as follows:

"When we were in the open sea, the Captain-General indicated to all the pilots the points where they had to steer, and asked them what route they pointed on their maps."

Pigafetta says that the needle on Magellan's ships pointed to the North Pole, deviating, however, a little from the true north. This sentence is left out by Mr. Harrisse, and then comes his quotation, as here translated:

"That our Captain-General very well knew, and so, when we found ourselves sailing in the open sea, he asked of all the pilots, to whom he had already indicated the point to which they were to steer, what course they marked on their charts, and they all answered that they did not mark a true course, and that it was necessary to correct the compass."

Another instance of this indifference occurs on p. 537, in the following passage:

"Ung livre, escript en Latin sur parchemin, de lettres au mole, faisant mencion des illes trouvées, couvert de satin de Bruges verd," etc.—"A book written in Latin on parchment, mentioning the islands discovered, covered with green Bruges satin." . . .

The words *lettres au mole* are not translated. They mean, *with pen-printed letters.*

Much the most useful part of Mr. Harrisse's work is that which contains the Chronology of Voyages, the Biographical Notes, and the Geographical Index. The data which he has brought together in these divisions must always be of service, though his self-confident tone here, as elsewhere, fails to win the reader. On p.

717, for instance, he closes the notice of Ferrer with these words:

". . . said to have been sent for by the Infant Henry of Portugal, to manage the famous Naval Academy of Sagres—*which has never existed!*"

Here also he translates with freedom. On p. 709 he tells the story of Carreño, who invoked the help of the Virgin during a terrible storm and was answered by the "Devil from the clouds, October 3, 1533: 'Who cares for her? Qué la quereys? Qué la quereys?'"

The English may express the devil's innermost feeling, but the Spanish words plainly mean: "What do you want with her?"

Some of the grave errors already noted, and many more which have been passed over, may be due to haste in the preparation of the volume; but this consideration does not lessen the author's responsibility.

The work required, and should have received, every possible care in preparation and in revision. The original texts quoted in various languages, each with its antiquated or arbitrary spelling, especially needed exact supervision; and this no one of them can be said to have received.

Mr. Harrisse's peculiar English frequently obscures his meaning. On p. 258 he writes of the "*defence* directed to the Pilot-Major, to construct maps"; meaning to say that the Pilot-Major was forbidden to construct maps (for sale). On p. 356 he says that "neither Muñoz nor Navarrete . . . make no further mention," etc. On page 387 it appears that a piece of poetry "was composed of two parts, the first of which being as follows." On p. 443 it is said that "we are not disposed to deny . . . that it would not be proper"; but

the exact contrary is meant. On p. 111 the vast continental land in the La Cosa map is said to *lay* "adjacent the West Indies." On p. 663 Mr. Harrisse says that he has made a list from names mentioned in various documents, and "specially from the *necronological* roll"; an original word, which finely combines the ideas of death and time with disdain for etymology.

An occasional slip in a name, such as *Columb* (p. 674) for Columbus, *Beecher* (p. 99) for Becher, or Cap Fear River (p. 212), may be overlooked; but throughout the book the Antilles are spoken of as the *Antillies*, and on p. 297 Mr. Harrisse has a bastard form, half Portuguese, half Spanish, for the name of the island which is rightly called Tristan da Cunha.

The printer has done his part to confuse the text. Almost every page presents instances of the interchange of *n* and *u*, *c* and *e*, or *o* and *u*.

On p. 31, *nanque* is printed for namque; on p. 88, *eins* represents eius; on p. 97, *continentum* appears for continentem; on page 104 is *isolo* for isola; on p. 139, *micosque* for mirosque, and *reperunt* for reperiunt; on p. 146, *Españols* for Española; on p. 155, *cuato* for cuatro; on p. 166, *mas* for mal; on p. 167 we have *miror* for mirar, and *la* for las; on p. 168 *hácias otras* for hácia atras; on p. 169, *ni* for nin, *ningund* for nengund, *descobiorto* for descubierto; on p. 181, *decit* for dicit; on p. 200 we find *iandiu* for iamdiu, *plarique* for plerique, *beneficentio* for beneficentia; on p. 432, *sub anni* 1503–1515; on p. 436, *addidis* for addidit; on p. 459, *natalis* for natali; on p. 463, *aislamentio* for aislamiento; on p. 525, Moluccas *insulis* for insulas; on p. 534, *fecat* for secat; on p. 535, *graeos* for grados; on

p. 537, Deux *appemondes;* on p. 556 appears for the second time a passage, erroneously printed as follows on p. 21 : "Terra *nec* ab Anglis primum fuit inventa," and there translated, "This land was first discovered by the English."

This is a typical instance of the necessity for the most careful proof-reading in such a book, *nec* and *hec* (hæc) being Latin words with wholly different meanings.

This list of printer's errors might have been very much extended, without including any of the corrections to be found on pp. 800–802. Allowing for these errors, it may be said that those, who have time to verify and to correct Mr. Harrisse's statements and quotations, will derive a measure of profit from the study of his book.

GEOGRAPHICAL NOTES.

BY

GEO. C. HURLBUT, *Librarian.*

THE SIXTH INTERNATIONAL GEOGRAPHICAL CONGRESS, LONDON, 1895.—The following notice was received in October:

PRELIMINARY NOTICE.

1 SAVILE ROW, BURLINGTON GARDENS,
LONDON W., JULY, 1892.

At the conclusion of the Fifth International Geographical Congress, held at Bern in 1891, a unanimous wish was expressed that the next Congress should be held in London. An intimation of this desire was conveyed by Dr. Gobat, the President of the Bern Congress, to the President and Council of the Royal Geographical Society, with the request that they would undertake to make the necessary arrangements.

The Council of the Society agreed to nominate an Organizing Committee for the purpose of taking all preliminary steps to ensure a successful meeting. The names of the members of the Committee are given overleaf. This Committee, after due deliberation, has decided that the Congress shall meet in the month of June in the year 1895.

It is considered desirable to send out this preliminary intimation at this early date, in order to give ample time for preparation both for the Congress and the accompanying Exhibition. In about a year it is hoped that the Committee will be in a position to issue a more detailed programme, and in the meantime suggestions would be gladly received, addressed to the Secretary.

LEONARD DARWIN,
Chairman of Committee.

J. SCOTT KELTIE, *Secretary.*

LIST OF THE ORGANISING COMMITTEE OF THE SIXTH INTERNATIONAL GEOGRAPHICAL CONGRESS, LONDON, JUNE, 1895.

Major LEONARD DARWIN, M.P., *Chairman.*
Rt. Hon. Sir MOUNTSTUART E. GRANT DUFF, G.C.S.I., &c., *President R.G.S.*

DOUGLAS W. FRESHFIELD,
HENRY SEEBOHM, } *Honorary Secretaries R.G.S.*

Rt. Hon. Sir GEORGE F. BOWEN, G.C.M.G., &c.
Colonel Sir CHARLES W. WILSON, R.E., K.C.B., F.R.S., &c.
General J. T. WALKER, C.B., R.E., F.R.S.
CLEMENTS R. MARKHAM, C.B., F.R.S.
Dr. R. N. CUST.
E. DELMAR MORGAN.
CUTHBERT E. PEEK, F.R.A.S.
HALFORD J. MACKINDER, M.A.
J. Y. BUCHANAN.
J. SCOTT KELTIE, *Secretary.*

The above have been appointed by the Council of the R.G.S.

Also,

Sir FREDERICK A. ABEL, K.C.B., F.R.S., *Representative of the Imperial Institute.*
Sir HENRY BARKLY, G.C.M.G., K.C.B., F.R.S., *Representative of the Royal Colonial Institute.*
FAITHFULL BEGG, *Representative of the Royal Scottish Geographical Society.*
General J. F. D. DONNELLY, C.B., R.E., *Representative of the Society of Arts.*
Rev. T. W. SHARPE, *Representative of the Education Department.*

ARCHÆOLOGICAL SURVEY OE EGYPT.—Attention is called to the following letter from the Vice-President of the Egypt Exploration Fund:

"The Egypt Exploration Fund, whose yearly excavations and annual *quarto* volumes are familiar to many outside of the scientific world, is engaged in a most important geographical, topographical and historical undertaking under the title of 'The Archæological Survey of Egypt,' the initial volume of which is now ready—a *quarto*, with forty-nine plates and illustrations (some in colors), to accompany the letter-press, describing fully the famous tombs of Beni Hasan. Subscribers of not less than $5 to the Survey will receive this volume and the Annual Report, containing the names of subscribers and interesting matter. Subscribers of not less than $5 to the yearly explorations receive the respective volume and report. The survey of Tel-el-

Amarna, in 1893, promises to be of equal value and interest to that of Beni Hasan.

"Of the mural scenes at Beni Hasan, Miss Amelia B. Edwards truly said that 'each wall-painting is an illustrated page from the history of social science between four and five thousand years ago.' There are pictures of people from the geographical nomes of Egypt and of foreigners *en route* to pay respects or tribute to the prince or governor; of the wild and domestic fowls and animals of the Nile valley; of the arts, industries and trades of the people, and representations of domestic life and 'society at court' that throw much light on how men lived and ruled at a period contemporaneous with the early Hebrew patriarchs. These delineations by pen and brush will be of popular and scientific value. The Survey aims at *exactitude* in the highest sense of the word. So important is this undertaking that I presented a paper upon Beni Hasan at the annual meeting of the American Oriental Society in Washington last April. (See Proceedings, pp. 207, 208.)

"Funds are absolutely needed for our work, and in the emergency MR. ALBERT AUB, No. 43 East 83d Street, or No. 41 New Street, New York City, kindly consents to receive subscriptions, to furnish circulars and to correspond upon the subject. He is a valued member of the American Geographical, and Egypt Exploration Fund, Societies. All subscriptions are privately acknowledged by me and publicly acknowledged in the monthly archæological magazine *Biblia*.

"WM. C. WINSLOW,

"*Vice-President of the Egypt Exploration Fund.*

BOSTON, December 15, 1892.

THE LETTER OF COLUMBUS ON THE DISCOVERY OF AMERICA.*—This beautiful volume, No. 41, of 250 copies printed on hand-made paper, is, it may be hoped, only the first of many publications for which scholars will have to thank the Trustees of the Lenox Library. The president's prefatory note says:

"The present facsimile, and reprint of the four Latin editions of the Columbus Letter, belonging to the Lenox Library, are published by the Trustees at this time, as an appropriate tribute to the memory of the great discoverer.

"JOHN S. KENNEDY,
"NEW YORK, October 21, 1892. President."

The introduction by Mr. Wilberforce Eames, Assistant Librarian, tells concisely and with the necessary bibliographical detail what is known concerning the editions of the Letter.

It is, perhaps, through an oversight that the name of the translator is not given. He seems to have done his work carefully and well, though he slips in the first line of p. 7, where he renders *naves hujusmodi* by *these kind of ships.*

EGLI'S NOMINA GEOGRAPHICA.—The second and greatly augmented edition of this admirable work has now reached its fifth number, which closes with the name *Nimrud Dagh,* the volcanic mountain chain on the western side of Lake Van, in Armenia. Few books are more entertaining, and the reader gives himself up with confidence to a guide who aims to walk on sure ground; for where Dr. Egli is not satisfied with a derivation he says so, after stating what is known.

---

* The Letter of Columbus on the Discovery of America. *A Facsimile of the Pictorial Edition, with a New and Literal Translation, and a Complete Reprint of the Oldest Four Editions in Latin.* Printed by Order of the Trustees of the Lenox Library. New York, MDCCCXCII.

He closes the notice of *Lausanne* with the words: 'Mehr Licht!'' and, after giving reasons for rejecting a tempting etymology of *Lisboa*, he remarks that here also it were desirable to have a good deal of light.

At the same time, no man can know everything and Dr. Egli, in a note on the cover of the fifth *Lieferung*, invites correction of errors. Two or three instances, in which he seems to have been misled, may be mentioned.

He begins the article on *Florida* with these words: "Florída, oft mit falscher Tonlegg, *Flórida*," etc.: "Florída, often with a false accentuation, *Flórida*," etc.

The peninsula has formed part of the United States for more than seventy years, and no American has ever called it *Florída*. The pronunciation *Flórida*, like the English pronunciation of Trafalgar, is irrevocably settled, and must be recognized as one of the two correct forms.

On p. 362, Dr. Egli says, without giving his authority, that the English navigator Drake bestowed the name of the Golden Gate on the entrance to San Francisco Bay, in 1578, when "he already knew that California was a land of gold," and that he thought the place would be the site of a world-city.

The tradition which associates Sir Francis Drake with San Francisco Bay was finally disposed of in a paper read before the California Historical Society, in March, 1889, by Prof. George Davidson, of the U. S. Coast and Geodetic Survey.

Prof. Davidson's acquaintance with the coast of California is exact and thorough; he proves that Drake could not see from Point Reyes the entrance to the Bay

of San Francisco, nor the sign of a harbor in that direction; that the white cliffs, which Drake saw every day before his eyes from his anchorage, do not exist in the vicinity of the Golden Gate; that the Farallones, which Drake saw "a little without" his harbor, are below the horizon of the Golden Gate, and that he could not have reached them from San Francisco with the summer winds without making several tacks towards Point Reyes; and that in the chart No. 85 of Dudley and in the Carta Particolare the soundings laid down in the channel to Drake's anchorage mark 8, 5, 4 and 3 fathoms, while the depth at the entrance to San Francisco Bay is 20 fathoms, and in the Golden Gate 60 fathoms.

The Golden Gate is said to have been so called for the first time by Fremont, in the *Geographical Memoir of California*, published in 1848.*

The whimsically trivial names too common in American geography do not disturb Dr. Egli's equanimity. He records on p. 255 the Dolly Varden Lake, and explains the name, as follows: "*Dolly Varden* is a technical term for the striped and flowered stuff, which was fashionable this year (1872) in America." He adds a quotation from a geographical journal, in these words: "This is a far more practical way of bestowing a name than the thousands of Victorias scattered by the Englishmen through the world."

Perhaps so, but that is a matter of taste, and the word *thousands* is a fine specimen of the figure known as

* The Annals of San Francisco, by Soulé, Gibson and Nisbet, New York, 1855; p. 149.

hyperbole. It must be added that the British Victorias are to be compared, not with Dolly Varden, but with the American Washingtons; and there is nothing to choose between them.

The supplement, it may be supposed, will register *Eritrea*, the appropriate name of the Italian colony on the Red Sea (Mare Erythræum), and the queer word *Ibea*, by which the English are pleased to designate the territory of the Imperial British East Africa Company.

NANSEN'S ARCTIC VOYAGE.—Dr. Nansen proposes to enter the Arctic Ocean on his five-years' voyage, or drift, in the early summer of 1893, through the Kara Sea, and to attain the highest possible point in open water to the west of the New Siberia Islands.

Beyond that point he will trust himself to the ice and the current which runs, as he believes, across the pole.

His vessel, the *Fram* (Forward), has been built after his own plans. It is 101 feet in length and 33 feet in width, pointed at both ends, with rounded sides and a comparatively flat bottom. The sides are from 28 inches to 32 inches in thickness, so as to give great strength and stiffness to resist the pressure of the ice, though it is Nansen's belief that, as this closes in, the ship will be lifted up and will in that way escape crushing.

The engine is of 160 horse-power and the daily consumption of coal is calculated at 2¾ tons.

Petroleum will be used for heating, and the cooking will be done with alcohol. There will be an electric motor, to be driven by a windmill or by a treadmill.

Six very strong boats will be taken, with every equipment, and sledges such as were used in the crossing of Greenland.

The party will consist of twelve picked men, including scientists, and the ship will be under the command of Capt. Otto Sverdrup, who was in the Greenland expedition.

Nansen will carry neither spirits nor tobacco among his stores.

Should the ship be crushed, the boats are strong enough to supply her place, and to save the crew.

It is supposed that the current from the Siberian coast will finally take the *Fram* to Greenland.

Those who are most familiar with Arctic voyages look upon this bold scheme without approval, but it seems well to recognize the fact that Dr. Nansen has adopted his plan with forethought, and after deliberate study of all the known conditions. He has found twelve men who share his convictions and who are ready to pass five years with him in the frozen North, far beyond the reach of human aid; and the daring should not obscure the reasonableness of the enterprise.

RAILROADS IN THE UNITED STATES.—The Interstate Commerce Commission issued in December a synopsis of the Statistics of Railways in the United States, as shown in the Fourth Statistical Report for the year ending June 30, 1891.

It appears that the total mileage was 168,402.74 miles. This number indicates the length of single track mileage, the total mileage of all tracks being 216,149.14 miles. The length of single track per 100 square miles of territory, exclusive of Alaska, was 5.67 miles, and the length of track per 10,000 inhabitants was 26.29 miles. The length of line in some States per 100 square miles of territory was

for Connecticut 20.77 miles, for Delaware 16.10 miles, for Illinois 18.25 miles, for Iowa 15.12 miles, for Massachusetts 25.99 miles, for New Jersey 27.71 miles, for New York 16.19 miles, for Ohio 19.68 miles, for Pennsylvania 22.77 miles. The only countries in Europe which have an excess of 10 miles per 100 square miles of territory are Germany with 12.77 miles, Great Britain with 16.52 miles, France with 11.23 miles, Belgium with 28.71 miles, Holland with 13.83 miles, and Switzerland with 12.43 miles. No country in Europe, Sweden alone excepted, has 10 miles of line per 10,000 inhabitants; while in this country but two States have less than 10 miles of railway per 10,000 inhabitants.

The increase in railway mileage during the year was 4,805.69 miles. This is less than the average of increase for several years past. The greatest activity in railway building seems to have been in the States lying south of the Ohio and east of the Mississippi Rivers, the total increase in these States being 1,670.83 miles.

There were on June 30, 1891, 1,785 railway corporations, of which 889 were independent companies for the purpose of operation, and 747 were subsidiary companies, the remainder being private lines. The report further shows that 16 roads have been abandoned during the year, and that 92 roads, representing a mileage of 10,116.25, have disappeared by purchase, merger, or consolidation. The actual number of railway corporations in 1891 is less than the number which existed in 1890, notwithstanding the fact that a considerable number of new lines were chartered during the year. The tendency toward consolidation is clearly indicated by the report. On June 30, 1891, there were 42 companies, each of which controlled a mileage in excess of 1,000 miles, and nearly one-half of the mileage of the country is the property of these 42 companies.

Another classification shows that there are 80 railway companies, each of which has a gross revenue in excess of three millions of dollars. The railways of this class control 69.48 per cent. of the total mileage of the country, receive 82.09 per cent. of the amount paid by the public for railway service, and perform 83.76 per cent. of the total passenger service and 82.66 per cent. of the total freight service of the country. Out of the total of 81,073,784,121 tons of freight carried one mile, the railways in question carried 67,008,448,436.

The total number of locomotives was, on June 30, 1891, 32,139, an increase of 1,999 during the year, and the total number of cars was 1,215,611, an increase of 45,944 during the year. The number of locomotives per 100 miles of line was 20; the number of passenger cars per 100 miles of line was 17: and the number of freight cars per 100 miles of line was 714.

The increase in equipment during the year, including locomotives and cars, was 47,943, while the increase in the equipment fitted with automatic couplers was 53,716, and the increase in equipment fitted with train brakes was 39,505. The estimated increase in equipment for the year 1892 is 29,821, while the estimated increase in equipment fitted with automatic couplers is 98,563, and the equipment fitted with train brakes is estimated to have increased 96,503.

The number of men employed on railways in the United States during the year covered by the report was 784,285, being an increase of 34,984. The number of

men employed per 100 miles of line was 486. The report brings an interesting fact to light by showing that the number of men in the employ of the railways in proportion to the total population was 1 to 87 inhabitants in 1889, 1 to 84 inhabitants in 1890, and 1 to 82 inhabitants in 1891. Each engineer carried on an average 369,077 passengers 1 mile and 2,329,639 tons of freight 1 mile.

The total capitalization of the railways of the United States is $9,829,475,015, or $60,942 per mile of line. This shows an increase in outstanding capital of $602 per mile of line as compared with the 1890 report. An analysis of the changes in capital outstanding shows that income bonds have increased from $76,933,818 to $324,288,690. A considerable portion of this increase is probably due to a conversion of stocks into income bonds. It is significant because it shows an increase in that form of property for the management of which directors are not held to strict responsibility. Equipment trust obligations have also increased from $49,478,215 to $54,755,157. A few years ago the opinion prevailed among railway men that the leasing of equipment by railway companies was fast disappearing. This opinion is not supported by the facts.

The gross earnings from operation during the year ending June 30, 1891, were $1,096,761,395, or $6801 per mile of line. Operating expenses were $731,887,893, or $4538 per mile of line, leaving the net earnings from operation $364,873,502, or $2263 per mile of line. The net earnings per mile of line were less than the net earnings of the previous year by $37. An analysis of gross income shows that freight traffic gave rise to $736,793,699, or 67.17 per cent. of total earnings, and that passenger traffic gave rise to $281,178,599, or 25.64 per cent. of total earnings. The amount received from carrying mail was $24,870,015, and the amount received as rentals from express companies was $21,594,349. The analysis further shows that $133,911,126 were received by railways as income from investments. The assignment of operating expenses shows that 34.08 per cent. is chargeable to the passenger service, and 65.92 per cent. to freight service. The percentage of operating expenses to operating income was 66.73 per cent. The number of passengers carried during the year was 531,183 988; the number carried one mile was 12,844,243,881. The number of tons of freight carried was 675,608,323, the number carried one mile was 81,073,784,121. The total number of miles run by passenger trains was 307,927,928, and the number of miles run by freight trains was 446,274,508. The average journey per passenger was 24.18 miles, and the average haul per ton of freight was 120 miles. The average number of passengers in a train was 42, and the average number of tons of freight in a train was 181.67. The average revenue per passenger per mile in 1891 was 2.142 cents, and the average revenue per ton per mile was .895 cent. The average revenue per train mile, passenger trains, was $1.06,111 and the average revenue per train mile, freight trains, was $1.63,683.

In narrating the statistics of accidents, the report continues its dreary tale of numbers killed and numbers injured, and shows that casualties during the year ending June 30, 1891, are greater than in any previous year covered by reports to the Commission. The number killed during the year was 7029, and the number injured was 33,881. Of these totals the number of employees killed was 2660

and the number injured was 26,140. The number of passengers killed was 293, and the number injured was 2972. A classification of casualties according to the kind of accident shows 415 employees were killed and 9431 injured while coupling and uncoupling cars; 598 were killed and 3191 injured falling from trains and engines; 78 were killed and 412 were injured from overhead obstructions; 303 were killed and 1550 were injured in collisions; 206 were killed and 919 were injured from derailment of trains; 57 were killed and 319 were injured from other accidents to trains than collisions and derailment already mentioned; 20 were killed and 50 injured at highway crossings; 127 were killed and 1427 were injured at stations; the balance, which makes up the total of 2660 killed and 26,140 injured, is due to accidents which do not naturally fall in the classification adopted for report. Referring to passengers, 59 were killed and 623 injured by collisions; 49 were killed and 837 injured by derailments; 2 were killed and 34 injured by other train accidents; the balance, making up a total of 293 killed and 2972 injured, being assignable to accidents at highway crossings and at stations and to other kinds of accidents.

This report emphasizes the necessity of legislation compelling railways to adopt train brakes and automatic couplers, and also suggests that some steps be taken besides the adoption of the train brake to prevent the frequency of casualties from falling from trains and engines. The large number killed and injured from collisions also brings prominently into notice the necessity of extensive use of the Block System in the handling of trains and a more perfect application of the principle of personal responsibility in the case of accidents. Not only are the accidents of the year covered by this report greater than those of previous years, but, when compared with the increase in employees, they are relatively greater than those of the previous year. Thus, during the year ending June 30, 1891, 1 employee was killed for every 296 employees, and 1 employee injured for every 30 men in railway service. The corresponding figures for the previous year are, 1 man killed for every 306 employees, and 1 man injured for every 33 employees. This same fact is also presented in another manner. The increase in the number of employees killed during the year covered by the report over the previous year is 9 per cent., and the increase in the number injured is 17 per cent., while the increase in the number of men taken into employment is less than 5 per cent. The corresponding comparison for casualties to passengers shows that, while there has been a relative decrease in the number of passengers killed, the number of passengers injured shows a much greater increase than the increase in the number of passengers carried.

The figures relating to railway mileage would be more satisfactory if they included Alaska. That territory is undeveloped, but it is a part of the United States and must be taken into account. The principle which excludes it applies equally to undeveloped areas in all

Territories and States and in other countries, and comparative statistics, elaborated on such a principle, must be regarded as an ingenious pastime.

To Change the Name of America.—The *Sociedad Científica "Antonio Alzate,"* of Mexico, at a special meeting held August 13, 1892, adopted, with one dissenting voice, the proposition of Messrs. Puga and Aguilar "that the society take the initiative in changing the name now borne by the New Continent for that of Colombia."

This is, perhaps, not the least remarkable of the utterances called forth by the celebration of the 400th anniversary of the Discovery, and it should not be lightly dismissed. It is true that there does not appear to be any machinery for effecting the change of name; but this is a matter of detail, and it were rash to assign or to assume a limit to the resources of science. Some objections suggest themselves. It may be doubted whether the change would tend to the increase of harmony, for while on the one hand it would put an end to the noise of the fight concerning the origin of the name *America*, on the other it would be the signal for a war to the last word on the question whether the continent should be called *Colombia* or *Columbia*. Are the people of these United States to go without a name while the debate is in progress? May not some other society, moved to emulation, rush in during the heat of the battle and turn us all into *Eriksonians?* The "Antonio Alzate" Society has yet time to avert these and other disasters by the simple process of reconsidering the vote.

THE SHUSWAP INDIANS.—Dr. George M. Dawson, Assistant Director, Geological Survey of Canada, contributes to the *Transactions* of the Royal Society of Canada, Vol. IX., a paper on the Shuswap Indians. The name is employed to designate all the Salish people of the southern inland portion of British Columbia, bounded on the east by the Kootenaha, on the north by the Tinneh, and westward by various tribes of the Lower Fraser and coast.

The winter dwellings of these people are partly subterranean, and the hollows marking the former positions of houses in certain parts of the country show that the diameter must have been in some instances as much as twenty-five feet. Upon the main framework of the house fascines of small sticks and brush are laid radially, and upon these the covering of earth is spread.

The winter villages represented the permanent centre of the tribal subdivision.

The permanent marks of old inhabited places are: *Sites of old Keekliwee-houses* (Chinook for winter dwellings); *old fish-câches*, hollows from three to six feet wide, cylindrical, and lined with bark; dried salmon were piled in these hollows and the place was covered with bark and earth; *root-baking places*, where a fire was built on a cleared spot. When the soil was sufficiently heated the roots, wrapped in mats or herbage, were laid on the bed of the fire and earth was piled over them. When dug out in a baked condition, the roots were eaten at once or dried for future use. After some years these root-baking places appear as low cones from fifteen to twenty feet in diameter, with miniature craters in the middle, and might easily be

mistaken by an imaginative person for old sacrificial sites.

Another enduring sign of an old camp is a little group of fire-scarred stones, buried in moss or other vegetation; the mark of an old sweat-house.

Near all the permanent villages or winter village sites are burial places, generally on sand-hills and often on prominent points of terraces or on low hills overlooking the river. No burial places were noticed on the higher plateaux or in the mountains, and it is probable that the bodies of those who died in such places were always carried down to the lower valleys.

A small house-like or tent-like erection was made over a grave, and this was usually surrounded by a fence or enclosure, while poles with flags or streamers were also set up. Some years ago carved or painted figures, generally representing men, were to be found about the graves along the Fraser and Thompson, but crosses are now very frequently substituted for the old carvings.

On the point of land between the Fraser and Thompson, near Lytton, is a low sand-hill about 150 yards long and 50 or 60 yards in width. This has been employed for purposes of burial. Near the sand-hill there are traces of an old village site. The strong up-river winds have resulted in curtailing the limit of the sand-hill on its southern side and extending it northward. In 1877 large numbers of bones, etc., were lying about, and the collections then made, including seven moderately perfect skulls, are now in the museum of the Geological Survey. It seemed that many or most of the bodies had been buried in the usual upright sitting

posture, though others appear to have been bent into a sitting posture and then laid on the side, and a few cases seemed to show that the bones had been laid closely together after the disappearance of the softer parts of the body. Yellow and red ochre was common in some of the graves, and one head had been thickly covered with red ochre. The best implements were those associated with bodies buried near the crest of the hill. It seemed obvious in all cases that the objects were rather intended to represent certain forms of property than to be of actual utility. Copper, in the form of small beaten sheets or plates, was the only metal certainly found in association with the interments. A small blue glass bead seemed to belong to one of the later graves. There was little or no evidence of traffic with the whites, and it was conjectured that the place had been abandoned shortly after the whites first reached the West Coast. The Indians now resident at Lytton state that they have no knowledge of the people who were buried at this place.

Various small animals appear to have been buried with some of the bodies, and it would appear that the people were rather hunters than fishermen, though the presence of numerous adzes seems to suggest canoe-making as an art practised. Shells of dentalium and perforated scallop shells (*Pecten caurinus*) show that trade was carried on with the coast.

Of objects found in these graves besides those above referred to, the following may be mentioned: adzes made of wapiti antler, precisely similar to those found in shell-heaps on Vancouver Island; jade adzes and chips and selvage pieces of jade cut from adzes during their manufacture; antler points and pointed bone awls

or bodkins; stone skin-scrapers; borers of chert or arrow-stone, and notched edges of the same, probably for scraping and shaping thongs; pestle-shaped hammers and one oval hammer of granite, well shaped, and with a deep median groove for attachment; straight pipes made of steatite, shaped much like an ordinary cigar-holder, and marked with patterns in incised lines.

Dr. Dawson notes the following customs:

In primitive times, when a man left a widow, his brother next in seniority took her to wife.

The proper name of a man is changed from time to time, the new name assumed being that of some dead kinsman. The chief calls a gathering of the people and the new name is announced, but without a ceremonial feast.

Young men on reaching manhood formerly went away alone into a solitary part of the country, where they remained three or four months. They were to keep away from other people.

Young women, at the time of reaching maturity, wander forth alone after dark, breaking small branches from trees and scattering or suspending them on other trees. The meaning of this still-prevailing custom is not explained.

All the Shuswaps formerly had hereditary hunting-grounds.

Devices for conveying information by signs are: a piece, or pieces, of material from a woman's dress, left in a forked twig, to show that a person, or a party, has passed; if the stick is upright, it means that the hour was noon; if inclined, it shows the direction of the sun at the time, or the direction in which the person went;

and to show both, a large stick gives the position of the sun, a smaller the route followed.

Besides the dug-out, small canoes are made of the bark of the western white pine (*Pinus monticola*). The inner side of the bark becomes the outer side of the canoe, which has projecting spur-like ends, and is lashed together and sewn with roots.

The salmon, which forms great part of the food, in taken in traps and weirs as well as in bag-nets, fastened to the end of a long pole. It is also speared by torch-light.

The Thompson Indians say that fire was originally obtained by friction of a wooden drill turned between the hands while the point was pressed against a dry poplar root.

Bows were made of juniper wood (*Juniperus occidentalis*) and also of yew (*Taxus brevifolia*). Arrows were made of the service-berry wood. With respect to the jade, which occurs in British Columbia among the natives, Dr. Dawson considers that it was obtained in the form of rounded masses from the gravel banks and bars of the Frazer and Thompson. Good specimens of jade adzes have been found at Little Shuswap Lake and at Kamloops. The jade was cut by quartz crystals.

The pestle-shaped hammer, common on the coast, is found in the Shuswap country, but the large stone mortar seems to be unknown.

The introduction of flour and the potato has diminished the importance of the native roots still used to some extent for food.

With reference to a small lizard, the Indians have a superstition that a man seeing one of them is followed

by it wherever he may go till it finds him when asleep, and entering his body proceeds to eat out his heart.

The late Mr. Bennett, of Spallumsheen, told Dr. Dawson in 1877, that the Indians employed by him in making a ditch, on coming into camp in the evening would jump several times over the fire in order to lead the pursuing lizard to enter the fire in attempting to cross. He also noticed that they tied up the legs of their trousers when retiring. If while at work during the day they saw a lizard, it would be caught in a forked twig, the ends of which were then tied together with a wisp of grass and the butt end of the twig afterwards planted in the soil. Thus treated the lizard became a mummy.

Nothing is known of the origin of these people, but their first acquaintance with the whites appears to have been about the beginning of the present century. A later event was the assassination of Samuel Black, who was in charge of the Hudson Bay Co.'s post at Kamloops. This happened, according to Bancroft, in the winter of 1841–42, and Dr. Dawson refers to it in order to point out that it has already become the centre of mythical stories among the Shuswaps, a fact which throws some light on the probable mode of origin of other mythological tales.

Some of the names given to the stars are interesting:

The Pleiades are called *hu-ha-oos*, or "the bunch," and also *kul-kul-sta-tim*, or "people roasting," from a story which relates that a number of women who were baking roots became changed into this group of stars.

The morning star is named *chi-whi-looh-tan'*, or "coming with the daylight," also *wo-pk-a'*, or "one with hair standing out round his head."

The four stars which form the quadrilateral of the Great Bear are known as the bear stars, ***kum-a-koo-sas'-ka.*** The three following large stars are three brothers in pursuit of the bear. One leads a dog (the small companion star).

The stars of Orion's belt are named ***kut-a-kekt'-la***, or "fishing."

The milky way is named ***chiw-i-wi-ow'-is***, the road or path of the dead.

The aurora borealis is named ***ses-a-am***, which appears to mean "cold wind," but this is uncertain.

The Sta'-tlum-ooh (Lillooets) call the Pleiades ***in-mox'***, meaning the "bunch" or "cluster"; the Great Bear ***me-hatl'***, the name of the black bear.

The face of the moon is said to represent the figure of a man with a basket on his back, and the name of this man is ***Wha'-la.***

Dr. Dawson closes his paper, which is illustrated by a map of the Shuswap country, with a list of 220 native names of places on the Kamloops sheet of the geological map of British Columbia, with their meanings.

HEIGHT AND POSITION OF MOUNT ST. ELIAS.—Mr. Mark B. Kerr, topographer of the expedition of 1890, prints in the *Transactions* of the Technical Society of the Pacific Coast, San Francisco, Vol. IX., No. 8, a discussion of results concerning the height and position of Mount St. Elias.

Mr. Kerr gives the ten measurements of the mountain, beginning with that of La Pérouse, in 1786, and ending with that of the National Geographic Society, and the U. S. Geological Survey, in 1891. He attaches

more weight to the result obtained by Malaspina, in 1791, than to any other of the earlier measurements, for the reasons that the vertical angle taken by Malaspina agrees closely with that of 1874, and that the general topography of his chart is comparatively trustworthy.

Dr. W. H. Dall, in 1874, made the height 19,500 feet, with a probable error of 500 feet. Mr. Kerr thinks that this limit of error is too small and that a closer approximation to the truth would be ±1500 feet.

The loss of the transit instrument early in the work of the expedition of 1890 prevented the carrying out of a scheme which, in Mr. Kerr's judgment, would have yielded better results than any other.

Mr. Israel C. Russell, in his report on the work of 1891 (*National Geographic Magazine*, Vol. III., p. 231), makes the height of Mount St. Elias 18,100 feet, with a possible error of 100 feet.

Mr. Kerr, taking into account the results of the computation of distances and the computations of heights from three positions, as well as the distance of the base stations from the peak, the different temperatures, atmospheric changes and uncertainty of refraction, concludes that the allowance for possible error is too small; and he is led to believe that the highest elevation recorded is too great and that the lowest is underestimated. "A mean of all the observations taken upon St. Elias," he says, "gives a result of 16,693 feet, and the writer is inclined to the belief that its true elevation, when determined, will not vary much from this mean."

The method is not unlike that of the philosopher who combined his information on Chinese metaphysics, but the result may stand.

Concerning the geographical position of the mountain, Mr. Kerr writes:

"The computation also of the geographic position of Mount St. Elias, using the Azimuth and angle of elevation obtained at Port Mulgrave by the U. S. Coast and Geodetic Survey in 1874, combined with elevation obtained by the expedition of 1891, is open to much criticism as a crude and unreliable method, and very little weight can be given to the result."

There was no indication of volcanic activity during the expedition of 1890, but an immense cloud of dust, which was seen rising from the avalanches rushing down the slopes of St. Elias, Cook, and Augusta, might have been taken by observers at a great distance for the smoke from a volcano.

ORIZABA.—Mr. J. T. Scovell, of Terre Haute, Ind., writes to the *American Naturalist* for October, 1892, a report of his measurements of Orizaba, made in 1891 and 1892.

In company with Mr. O. G. Bunsen he carried a line of spirit levels up to the 14,000 level on the mountain and made two ascents from that point, one on the 29th of July, the other on August 3, 1891. The average of the two results obtained with an aneroid barometer adjusted by comparison with a standard mercurial barometer was 18,179.16 feet.

In April, 1892, assisted by Señor E. O. Moreno, Mr. Scovell measured a base line 1550 feet long, near the 13,000 feet level and obtained the angles necessary to determine the elevation of the peak above each end of the base line. The results were:

Railway levels from tide-water at Vera Cruz to Chalchicomula, . .	8313.571 ft.
Spirit levels from Chalchicomula to Station A, ...	4696.188 "
Triangulation from Station A, . .	5302.267 "
Elevation, . .	18312.026 "
Spirit levels from Chalchicomula to Station B, ...	4720.569 ft.
Triangulation from Station B, . .	5282.146 "
Railway levels (as above), . .	8313.571 "
	*18316.286 "

The mean elevation is 18314.156, a result which does not greatly differ from that of 18,205 feet, obtained by Prof. A. Heilprin. This observer's measurement agrees still more closely with the 18179.16 feet, obtained by Mr. Scovell with the aneroid barometer, and there is little reason to doubt the conclusion that Orizaba is the highest mountain in Mexico and, possibly, in North America.

THE PROCEEDINGS OF THE ROYAL GEOGRAPHICAL SOCIETY.—It has been resolved by the Council that with the beginning of 1893 the title of the Royal Geographical Society's monthly publication shall be changed from "Proceedings" to "The Geographical Journal."

The size of the publication will be increased to 96 pages, and maps and illustrations will form a more prominent feature than in the past. An index to the

* This total is printed 18316.687 in the *American Naturalist.*

fourteen volumes of the new Monthly Series (1879–1892) will be prepared and issued.

THE EUROPEAN RACE OUTSIDE OF EUROPE.—M. Em. Levasseur, in an address before the late Italian Geographical Congress, at Genoa, on the subject of emigration, made a calculation of the number of Europeans and persons of European descent in the world, outside of Europe; individuals, that is to say, of pure blood, or of mixed blood in such proportion that they might fairly be considered as belonging to the race.

He found that there were of such persons, in the year 1800, 9,500,000 principally in America. This was the result of three centuries of colonization and conquest.

"Ninety years later," says M. Levasseur, "I find that the number of representatives of the European race, outside of Europe, amounted to 91,500,000; and though this calculation, like that for the year 1800, cannot be regarded as exact, it is certainly nearer to the truth than the earlier estimate because the statistical data for 1890 were more numerous and more worthy of confidence than those which could be brought together for the year 1800.

"It follows that, in 90 years, the number has increased tenfold.

"Among the phenomena of the nineteenth century, this is one of the most important, for this development of the European race has changed the political economy of the world."

Mr. de Semenov, president of the Imperial Russian Geographical Society, who followed M. Levasseur, called attention to an expansion of the European race

in a region generally overlooked by statisticians. He pointed out the fact that geographers in former ages, and even as late as the eighteenth century, regarded the Don, or at most the Volga, as the eastern limit of Europe. There is, even now, some difference of opinion with regard to this limit, but most persons fix it at the Ural Mountains and the river Ural.

Mr. de Semenov showed that the geographers of former times were correct in establishing the Asiatic boundary more to the westward, because in the sixteenth century the great plain of eastern Europe was really an Asiatic country, inhabited by Tatar hordes.

Little by little these were conquered and absorbed, or expelled, by Russia, and their place was filled by Muscovite settlers; and Mr. de Semenov estimated that Europe had gained in this way an addition of 30,000,000 inhabitants.

MR. CONWAY IN THE KARAKORAM.—In the *Proceedings* of the Royal Geographical Society for November, Mr. Conway reports the doings of his party in the Karakoram Range during the month of August.

They first attacked the great Baltoro glacier, which was found to be covered for two-thirds of its length with stone-*débris*, so that the ice was not visible, except where lakes or crevasses occurred. There was no passage along the banks of the Baltoro and the route led straight up the middle of the ice, over a series of prodigious mounds, one of which was 200 feet in height. The weather was very bad and the progress was slow, but there was compensation in the magnificence of the scenery.

After four days camp was pitched by the side of a little lake on the north bank, and it was determined to ascend a peak to the north, supposed to command a view of K2, or Mount Godwin-Austen, the second highest mountain in the world.* Early in the morning of the 10th of August an enormous mountain, not marked on any map, was in sight, about fifteen miles away to the southeast. Mr. Conway named it the Golden Throne, because "auriferous veins permeate its mass," though it does not appear how he became acquainted with this interesting fact. He and his men headed for the Golden Throne, and did some very rough work on the way. The elevation was more than 17,000 feet, but no inconvenience was felt from the rarity of the air, and even at 20,000 feet all went well, so long as no great exertion was made.

---

* Mr. Conway here makes a digression on names. It has been proposed, he says, to attach to K2 the name of Col. Godwin-Austen, but, "as it is surely inappropriate to exchange the ancient and beautiful name of Gaurisankar for that of Mount Everest (euphonious though it be) so neither does it seem to me suitable to call the monarch of the Mustagh Range Mount Godwin-Austen." He chooses to call it the Watch-Tower of India, though the name it bears was formally bestowed upon it in 1888 by the Royal Geographical Society.

In the *Proceedings* of the R.G.S. for December, p. 857, appears the following letter from Mr. Conway, dated Abbottabad, Nov. 2, 1892: "After we left Askoley for the Baltoro Glacier, Mr. Eckenstein, who remained behind, found a man who drew for him on the sand a rough map of that glacier and its surrounding mountains. He put in both the Mustagh Passes, the Mustagh Peak, K2, Gusherbrum and Masherbrum, all in their right places. He stated that Skinmang is the local name for the great Mustagh Peak, and Chiring the name for K2. I have recently noticed that though the great Mustagh Peak is scarcely, if at all, indicated on the Government map, it is quite clearly marked on the map that illustrated Col. Godwin-Austen's paper in the 'Proceedings' of the Royal Geographical Society."

The paper referred to is probably the one published in the R.G.S. *Journal*, Vol. XXXIV., 1864. and in the accompanying map Chiring is placed 20 miles to the west of K2.

On the 18th of August the explorers encamped at an elevation of 16,500 feet, at the foot of the Golden Throne, with a peak of 25,000 feet on each side, and glaciers radiating in every direction. A week was spent in gradual approaches and on the 25th the peak was assaulted from the Upper Plateau Camp, at an altitude of 20,000 feet. The climbing was very hard, and the men had frequently to stop and rub their feet to save them from frost bite, though the heat of the sun was oppressive. After passing the first point on a ridge 1,300 feet above the camp, the party came to another ridge of snow-covered blue ice, so hard that every step had to be cut with the axe, and Zurbriggen, the Swiss guide, though he never faltered, found the work very fatiguing. The top of a third peak, which Mr. Conway calls the Pioneer, was reached at last, and 1,300 feet above was the summit of the Golden Throne, cut off from approach by a deep depression; and this was the end of the work.

A roof of cloud was poised about 2,000 feet above the peak, and not a sound broke the utter stillness of the air.

Mr. Conway photographed the panorama and took such measurements as were possible, some of his instruments having been left behind with two of the Goorkhas, who had been overcome by the mountain sickness. The barometer stood at 13.30 inches and the thermometer at 54°, Fahrenheit. There was no insufficiency in the supply of oxygen, and Zurbriggen smoked his cigar in comfort. "Finally," says Mr Conway, "I took tracings with the sphygmograph of Zurbriggen's pulse and mine; and here the damaging effect of alti-

tude made itself apparent. Our lungs were working well enough, but our hearts were being sorely tried, and mine was in a particularly bad state. We had all nearly reached the limit of our powers."

The Calcutta correspondent of the London *Times* wrote on the 26th of September that Mr. Conway had gone to Leh to compare his barometer with the standard there, and that he expected to show that his party had attained a height of at least a thousand feet above Schlagintweit's 22,230 feet in Nepaul, "the highest climb hitherto authentically recorded."

This called forth the following letter:

To the Editor of the Times:

SIR:—Will you allow me to point out that your Calcutta Correspondent was in error in stating that the highest climb hitherto authentically recorded was that of the Schlagintweits in Nepaul, the height being 22,230 ft.?

Early in September, 1883, Mr. W. W. Graham, accompanied by the late Emil Boss and the guide Ulrich Kauffmann, climbed Kabru, in Sikkim, the height of which, according to the Government Trigonometrical Survey, is 24,015 ft. It is true that in his paper read before the Geographical Society in 1884, Mr. Graham stated that he did not reach the absolute summit, "which was little more than a pillar of ice 30 ft. or 40 ft. above our heads." But if 40 ft. are deducted, the point he gained must yet have been very little under 24,000 ft. His paper, which has a special interest at the present time, will be found in vol. vi. of the "Proceedings of the Royal Geographical Society," and the sentence I have quoted is on page 440.

Yours faithfully,

Savile Club, Oct. 2. J. S. MASTERMAN.

THE AFRICAN DEATH ROLL.—M. Henri Duveyrier, in a memoir entitled *L'Afrique Nécrologique*,* has recorded the names and achievements of the African explorers who lost their lives by disease or by violence between the years 1800 and 1874. The list contains 160 names.

* Published in the *Bulletin de la Société de Géographie, Paris*, 1874, Tome VIII., pp. 561–644.

M. L. Lanier, in his book *L'Afrique*, published in 1884, added to M. Duveyrier's list the names of fifty-six victims, who perished in the period 1874–1884; and M. Paul Barré, in an article in the *Revue Française*, Dec. 15, 1892, brings the story down to the present time, with 158 names for the nine years 1884–1892. He says:

"We may therefore estimate at 374 the lives that have been lost to the civilized world in this century for the sake of unknown Africa. And in these we count only the isolated explorers, those who attempted the peaceful conquest of the black continent.

"It must be left to military annals to register the soldiers who have fallen in the numerous expeditions undertaken by the European powers."

The distinction is well stated, but M. Barré fails to observe it. On pp. 572–573 he gives the names of fourteen French officers, who met their death in the recent campaign against Dahomey, certainly not a peaceful enterprise, however necessary and useful to mankind.

This remark applies also to the name of Lieut.-Colonel Cristoforis, the Italian officer who was killed, with his whole command, by the Abyssinians at Dogali.

It is not easy, indeed, to say who should, or should not, be excluded from such a roll. It would be strangely incomplete without Gordon; and yet Gordon was not shut up in Khartum as an explorer.

After him, but still famous for good work, come Paul Soleillet, Dr. Nachtigal, Dr. Crozat, Count Porro, Bishop Hannington, Capt. Stairs, Father Lourdel, Dr. Böhm, Capt. Vandevelde, Paul Crampel, Dr. Jühlke

and Lieut. Günther, Dr. Lüderitz, who founded the German colony Angra Pequena, and Silva Porto, who crossed Africa from the Atlantic to the Indian Ocean, in 1853–1856.

There are, however, some names which have been overlooked by M. Barré, and among them Lieut. Tappenbeck, Baron Negri and Dr. Weissenborn.

The mortality for the past nine years, as great as that for the period 1800–1874, bears testimony to the extent of the European interest in Africa.

MONTEIL'S ARRIVAL IN TRIPOLI.—M. Monteil reached Kano, in his journey eastward from the Niger, on the 25th of November, 1891 (*see* BULLETIN No. 3, 1892, p. 441). October 17, 1892, he wrote from Tedjerri, Fezzan, to the French Consul at Tripoli:

"To-day I entered the territory of Fezzan at Tedjerri, coming from Kuka (Bornu). I left Kano on the 19th of February and arrived at Kuka, where I was very well received, on the 10th of April Kuka I left on the 15th of August with a guide, who was ordered by the sheik to go with me to Murzuk. On the 12th of September I reached Kaur and set out again, on the 29th, for Tedjerri. Nothing of note has occurred, beyond the loss of a good many camels.

"I expect to be at Murzuk on the 25th (October), and to remain just long enough to arrange all things to start for Tripoli.

"Badaire has borne the fatigue admirably, and all my people are with me except two men who left us at Kuka." It was at this place that M. Monteil found Dr. Nachtigal's Italian servant Valpreda, now a good

Mohammedan, who had almost forgotten his native tongue.

The party arrived at Murzuk and M. Monteil wrote to Capt. Binger from that place on the 30th of October a letter, in which he says:

"I have already hired camels for the (Wadi) Shiali, where I shall reorganize a caravan by hiring camels, and expect, if nothing interferes, to reach Tripoli in the first fortnight of December. My own health is good; Badaire suffers with swelling of the legs. The journey across the Sudan to Lake Tchad and that across the Sahara have been made without accident."

According to the *Revue Française* (Dec. 15, p. 582), which quotes this letter without dating it, Murzuk was not reached till the 4th of November.

The explorers started again, Nov. 7th, and arrived at Sokna, nearly midway on the route to Tripoli, on the 18th. They set out again on the 22d, passed through Beni-Ulid and entered Tripoli on the 10th of December.

It is remarkable that throughout this long journey in strange countries, some of them previously unknown to Europeans, M. Monteil met with no opposition, but was everywhere received with kindness.

Forced Labor in Egypt.—Sir Colin Scott Moncrieff, Under-Secretary of State, Public Works Department, Cairo, wrote in *Nature* of June 18, 1891 (p. 153), as follows:

"The above paragraphs describe generally the improvements that have been brought about in the last seven years. Second to none is the boon that has been conferred on Egypt in the abolition of the *corvée.*

. . . We estimated that to redeem this *corvée* and to pay for all this labor would cost £400,000. Nubar Pasha, in the face of the greatest financial difficulty and opposition, managed to give an annual grant of £250,000 for this object. Riaz Pasha, at the end of 1889, found means of granting the remaining £150,000 and in 1890, for the first time, perhaps, in all history, there was no *corvée* in Egypt."

Sir Colin, as a friend of humanity, must have read with mingled feelings Mr. Cope Whitehouse's letter, here reprinted from the New York *Nation* of November 17, 1892:

THE NILE CORVÉE.

TO THE EDITOR OF THE NATION:

SIR: In his recent book, "Egypt To-day," Mr. Frazer Rae states that "in December, 1889, the *corvee* was totally abolished in Egypt, for the first time, probably, in all the thousands of years of Egyptian history" (page 177). Mr. Frazer Rae refers to me in such kind terms that I have every interest in maintaining his accuracy. He took infinite pains to arrive at the truth, and if he did not always attain the goal, the obstacles were such as would deceive, if it were possible, the very elect.

No more exact date is given on which the Egyptian serf emerged from the long bondage into the liberty enjoyed by every peasant of Europe. No "Emancipation Proclamation," no "Decree of the Council of Ministers," no "Statute of the Legislative Council" is cited. Mr. Frazer Rae gives as his authority the N. Y. *Nation*, April 21, 1892, p. 299. In a letter from Mr. Woodruff, of whose painstaking efforts to estimate at its fair value the influence of the English occupation of Egypt I was personally cognizant, it is said that the English set about to abolish the *corvée* as a part of their task. The Dual Control of Egypt had long exercised a power which rendered the abuse of the *corvee* impossible without the knowledge, and therefore acquiescence, of Major Baring. In 1882 the entire control passed into the hands of England. In 1884, M. Rousseau having been dismissed, Sir C. C. Scott-Moncrieff was made Under-Secretary of State for Public Works. He held office until July, 1892. In the (London) *World*, October 19, 1892, Sir C. C. Scott-Moncrieff informs its representative that he had instituted many humane and useful reforms.

"For instance, he abolished the *corvée*, a system of State unpaid, forced labor, which pressed most grievously upon the people and constituted one of their great grievances. The *corvée* was employed to repair the banks of the canals, to clear the canals of silt deposit and to assist in the works of irrigation; but, as the only

remuneration received was meted out in blows and stripes, the effect of this employment may be easily imagined."

This is a correct account of the *corvée;* but when was it abolished, in law or in fact? The law of January 25, 1881, was modified by Arabi Pasha, on March 12, 1882, in favor of the Bedouins. A ministerial order was issued on March 1, 1887, signed by Sir C. C. Scott-Moncrieff, allowing "the tenants of the Pashas" the privilege of redeeming themselves. On January 29, 1888, a decree of the Council of Ministers extended this right of redemption, at forty piastres ($2.00) per man, to the peasants of *certain* provinces. In 1889 the *corvée* was in force in eight provinces, for the clearance of silt and winter work. "The works were most thoroughly kept in order by the money of the *corvée* ransom, the *corvée* relief, and the *corvée* themselves." (Report, p. 60, §112, Cairo, 1890.) In 1891—nine years after the British occupation—her Majesty's Government published a report by Sir E. Baring, in which he says, "The *corvée* has been wholly abolished." (Egypt, No. 3, March 29, 1891, p. 38.) Sir C. C. Scott-Moncrieff had made the same statement in *Nature*, and Sir E. Baring adopts it with the context almost without verbal change.

Thus Mr. Woodruff and Mr. Frazer Rae might appeal to authorities of the highest repute to sustain them in their position. Nevertheless, it is untenable. The *corvée* has never been abolished. It was called out within a month after Sir E. Baring had said that it had ceased to exist, in April, 1891, to fight the locusts, under the direction of Mr. Wallace of the College of Agriculture. It is in full operation at the present moment. On October 5, 1892, the *Journal Officiel* published (in English) that "Major Brown, Inspector-General of Irrigation for Upper Egypt, is still much dissatisfied with the work of the Kenah *corvée*." On October 8th, "Major Brown specially praises the Mudir [Governor] of Beni-Suef, Mustapha Wahbi, for the very excellent arrangements he has made and the way in which the *corvée* has been worked."

Nor are the numbers of these forced, unfed and unpaid laborers insignificant. In Gharbieh, three thousand peasants were requisitioned from other districts to work in the district of Chirbin. The Governor of Menufieh moves about his province, accompanied by a gang of 500 workmen. In Minieh, 17,513 *corvéables* were reported as under orders on October 10th. In Behera, 1350 laborers were employed at a single point. In Menufieh, 1200 men were at work on one bank. These facts are taken from the official organ of the Egyptian Government, pp. 1208 and 1209.

Fine and imprisonment are the legal penalties for disobedience. The law provides, however, for its own suspension, and remits the case to a Commission, formed, like the Lynch tribunals, out of a group of the neighbors, without a magistrate, who must decide, on the demand of the engineer, within twenty-four hours. There is a picturesque account, too long to quote, of a peasant, Abd el-Aty el-Sarry, who appealed to the Khedive in person in behalf of his father. "The old man" had been beaten, in spite of his obedience to the summons. The village chief admitted that he had inflicted blows. He was "invited" not to

repeat this form of compulsion on the bodies of those under his orders (*Journal Officiel*, September 29, 1892, p. 1203).

There is an ancient tale in which the little boy alleged that he was provided with a large number of first cousins, although his father had never had brother or sister and his mother had been an only child. The sole explanation necessarily imputed to the lad a disregard of truth. I recommend the moral to those who, like myself, can find no other explanation of the contradictions I have cited.

COPE WHITEHOUSE.

LONDON, October 24, 1892.

THE NILE FLOOD.—The flood, which came upon Egypt in September last and did great damage, is accounted for by Capt. Lugard, in his paper entitled, *Travels from the East Coast to Uganda, Lake Albert Edward and Lake Albert*, in the *Proceedings* of the Roy. Geog. Soc. for December. He says, on p. 827:

"The close of the year 1891 and the early part of 1892 were exceptional in the matter of rainfall. Usually in this part of Africa the lesser rains begin early in October and cease in the middle of December. From that time the heat and drought increase, and the grass dries up and is burnt, till in the beginning of March the greater rains set in, and a tropical downpour continues with few breaks till the end of May. Last October and November* the lesser rains were unusually heavy, and continued with little intermission till the time of the regular rains in March. There was a little check, and then the rain continued up to the time I left Uganda, in the middle of June. Still they did not cease, and we found the rivers, which should have been running down, all abnormally high. We did not leave this zone of rain, or the rains did not cease (I know not which), till we descended from the Mau plateau at the end of July, and found there had been much drought in Masai-land and Kikuyu. The result was that the Lake Victoria was some six feet perhaps above its ordinary level, and may probably rise still higher. I looked forward with interest to hear if this should have caused any appreciable change in the height of the Nile in Egypt. I found that unusual floods had occurred in September, this not being the time at which the usual high Nile, due principally to the floods poured down by the Atbara from Abyssinia, occurs; and apparently the water took about the same time to reach Egypt, travelling some 3000 miles, as it took me to reach the east coast, which I did on September 1st. This incident is not without its significance. Had I, in Uganda, been able to telegraph or heliograph the news of the abnormal rainfall, and the rise of the Victoria Lake, possibly steps might have been taken to prepare for the floods, and much of the damage caused might have been saved. Egyptian ad-

* 1891.

ministrators may perhaps find herein a new argument for the retention of Uganda!"

Another argument, advanced by Mr. Bosworth Smith, is taken up by a competent authority in the following letter, which appeared in the London *Times* of December 20:

UGANDA AND EGYPT.

To the Editor of the Times:

SIR:—In the letter from Mr. Bosworth Smith it is said that if it had not been for the occupation of Uganda Germany would be dominating the sources of the Nile and controlling the water supply "on which the very existence of Egypt depends." Perhaps it may be useful to explain this sentence—a sentence not rhetorical, but judicial, a sentence which unquestionably may become one of life or death to a proportion of the six millions who dwell between Wady Halfa and the sea.

There is not the slightest reason to apprehend that any successful effort could be made to deprive Egypt of an ample supply of water during the inundation; nor does the red water, of such priceless value, come from the Equatorial sources of the Nile. But if as a military operation, or the result of engineering works at the Lakes, a very small amount of flood water were suddenly let loose in September it might produce widespread disaster. The Nile in flood may be discharging 1,000,000,000 cubic mètres in a day. The addition of one-tenth would raise the Nile about twenty inches, quite sufficient to sweep away the earth embankments, now maintained only by unremitting care and the labour of over 100,000 men.

At low-Nile no water reaches the Mediterranean which has not done service in irrigation for three months. Practically all this water passes through Victoria Nyanza. It is during this period, when the total supply for one hundred days is not more than two days' supply in flood, that any Power, holding the Nile or its tributaries, can deprive Egypt for a fortnight, or even longer, of the whole natural discharge of the river through the Nubian Gate at Assouan.

COPE WHITEHOUSE.

8 Cleveland-row, St. James's, December 13.

MASSACRE OF THE HODISTER EXPEDITION.—Details of the destruction of this party on the Congo were received in Paris, on the 6th of December. M. Hodister sent four agents to establish factories at Riba Riba and at Kasongo. Lieut. Mikils accompanied these agents, with four soldiers and a trumpeter.

The Arabs and the natives at Riba Riba refused to recognize the authority of the Congo State and mur-

dered Lieut. Mikils and M. Noblesse. Their heads were stuck on long poles in front of the Chief Nserera's residence.

M. Hodister and three other Europeans, who had been engaged in establishing factories at points on the Lomami, were captured by the natives, tortured, and then eaten.

The report of these atrocities was brought to Stanley Falls by Lieut. Mikils' boy slave, who belonged to a nephew of Tipu Tip, and so escaped with his life.

UGANDA.—It was in 1875 that Henry M. Stanley introduced Christianity into the Kingdom (or Empire as he called it) of Uganda, which lies just north of the Victoria Nyanza. The King Mtesa had been won over to Mohammedanism, but Stanley, who seems to have missed his true calling, went at him with energy.

"Nothing occurred in my presence," he says, "but I contrived to turn it towards effecting that which had become an object to me, viz., his conversion" (*Through the Dark Continent*, Vol. I., p. 202). The result is told on p. 209 of the same volume.

"I have, indeed, undermined Islamism so much here that Mtesa has determined henceforth, until he is better informed, to observe the Christian Sabbath, as well as the Muslim Sabbath, and the great captains have unanimously consented to this. He has further caused the Ten Commandments of Moses to be written on a board for his daily perusal—for Mtesa can read Arabic—as well as the Lord's Prayer and the golden commandment of our Saviour, 'Thou shalt love thy neighbor as thyself' . . . But, oh! that some pious, practical

missionary would come here! . . . It is not the mere preacher, however, that is wanted here. . . . It is the practical Christian tutor, who can teach people how to become Christians, cure their diseases, construct dwellings, understand and exemplify agriculture, and turn his hand to anything, like a sailor—this is the man who is wanted. . . . He must be tied to no church or sect, but profess God and His Son and the moral law, and live a blameless Christian, inspired by liberal principles, charity to all men, and devout faith in Heaven."

Stanley's appeal brought the missionaries, Protestant and Catholic, but Mtesa wavered in the faith and died at last a Pagan.

His son Mwanga became weary of the strife and bickerings between the so-called Catholic and Protestant parties in his kingdom, and made war upon both of them. They united and deposed him and placed Kiwewa, a son of Mtesa, on the throne. Kiwewa divided his patronage between the Protestants and the Catholics, to the disgust of the Mohammedans, who combined with the Pagans and deposed Kiwewa in favor of Kalema, another of Mtesa's numerous family. They then drove out the Christians, who took refuge in Buddu, on the western shore of the Victoria Nyanza. Mwanga fled to the Roman Catholic mission farther south, where he was kindly received and became, as it seemed, a convert, though it is affirmed that he wrote at the same time to assure the Protestant missionaries that he wished to be guided by them.

It is certain that the Christians in Buddu supplied themselves with arms, and united their forces to reconquer Uganda and restore Mwanga to power.

This they succeeded in doing, and then the religious and political animosities broke out afresh among the conquerors.

The Protestants were English and they chose to regard the Catholics as French, in order to avail themselves of the national feeling and strengthen their cause in England; but there is no evidence that the Catholic Fathers, who represented three or four nationalities, were in any way acting as agents of France, and it is expressly stated in the October number of *L'Afrique Explorée et Civilisée*, p. 311, that before the conclusion of the Anglo-German treaty of July, 1890, Mwanga had invited France to assume the protectorate of Uganda, and that the invitation was declined. Mwanga appears, from all the indications, to wear as many faces as a civilized white man; but, once restored to the throne, he declared himself a Catholic and distributed his offices among the Catholics. The Protestants seemed to be beaten, when the British East Africa Company sent Capt. Lugard, in the year 1890, to take possession of the kingdom, in virtue of a pretended treaty which placed Uganda and its dependencies under the control of the Company. The advantage of numbers was with the Catholic party, estimated at 25,000, while the Protestants were but 4000.

Capt. Lugard arrived at the end of December, 1890, with a strong force, well-armed with rifles and machine guns. He remained for a year, administering the country under difficulties, and doing his best to promote good feeling by fighting the Mohammedans. Even this did not succeed, and at length, on the 24th of January, 1892, Capt. Lugard, however reluctantly, "felt it to be

his duty to appeal to arms for the maintenance of justice." This he did with complete success. The Catholics were routed, the missionary stations were destroyed and the Fathers took refuge with the Germans at Bukoba, on the western shore of the Victoria Lake. Mwanga and the native Catholics were driven out of Uganda into Buddu, and it is said that the king, under stress of circumstances, has become a Protestant.

Capt. Lugard, it must be noted, tells a somewhat different story, in his answer to the charges made against him by the Catholic priests through the French Ambassador in London. He declares that quarrels between the two factions were of common occurrence, but these were quite as much on the part of the Roman Catholics as the Protestants; that it was the murder of a Protestant by a Roman Catholic in the streets of Mengo, and the insolence of the Catholics in refusing to deliver the murderer up to justice, that brought about the war; and that it was the Catholic party, who entirely and of purpose provoked the war, "gratuitously taking the onus off his hands" He maintains that his own attitude was one of strict impartiality; yet he took the side of the Protestants in the struggle, just as he had previously made war upon the Mohammedans.

Through him the British East Africa Company obtained control of Uganda, but the scandal of this deplorable warfare between Christian teachers engaged in the work of civilization roused the British public, and the Government found itself forced to intervene and to assume the administration. Sir Gerald Portal has been appointed Commissioner. On the 8th of December, he

was at Zanzibar, where he was to be joined by the following gentlemen, who compose his staff:

Mr. E. J. L. Berkeley, of her Majesty's Consular Service, recently acting as Administrator of the Imperial British East Africa Company's territories in Africa; Colonel F. W. Rhodes, D.S.O., 1st Royal Dragoons, Military Secretary to the Governor of Bombay; Major E. R. Owen, Lancashire Fusiliers; Captain M. R. Portal, North Lancashire Regiment; Lieutenant Arthur, Rifle Brigade, at present serving in the local forces at Zanzibar.

Mr. Stanley was among those who undertook to enlighten the British public on the subject of the new "Imperial landed property," as he called it in a speech before the Constitutional Club, on the 7th of December. Uganda proper, he said, curves like a bent bow from the Alexandra Nile to the Victoria Nile at the northwest portion of the Great Nyanza, and is about 30,000 square miles in extent; but the old Uganda empire, which is nearly alike in character and value, is about 90,000 square miles, and by far the most valuable portion of the territory which was included in the charter of the British East Africa Company.

He described the people as the finest native race in the whole continent from the Cape to Egypt.

The railroad from Mombasa on the Indian Ocean to the Victoria Nyanza would develop, he affirmed, an immense trade. The lake terminus of the road would become the Chicago of Africa.

In five years it would be more populous than Zanzibar, and its trade would amount to £6,000,000 a year. This picture of prosperity delighted his hearers, but

one of them, Mr. J. E. Cooke, asked for information concerning the religious disturbances.

Mr. Stanley answered him, as reported in the London *Times* of Dec. 8: "He had escorted two of the Roman Catholic missionaries from Lake Victoria to the sea, and he read those gentlemen perfectly. He heard them whisper and talk to one another; and it was his speech at that time which caused the Roman Catholics to be sent to Uganda.

"He had met Roman Catholic missionaries in many parts of the world; he had met good men at Bagamoyo in 1872, but those men were not the missionaries in Uganda.

"The missionaries in Uganda quarrelled; Capt. Lugard wished to put an end to that quarrelling and therefore he parted the kingdom into three. The points which had been raised by Mr. Cooke were small details. As an English officer Captain Lugard had done his duty."

These words, not less sincere than the professions of unbounded charity made by the apostle who converted King Mtesa in 1875, fitly close a shameful chapter in the history of the European dealings with Africa. England acquires, by whatever indirect methods, a coveted possession, and it is a positive gain to the cause of civilization that, under her recognized authority, Christians must hereafter learn to keep the peace in Uganda.

LIEUT. FREDERICK SCHWATKA.—Lieut. Schwatka, who had achieved celebrity as an Arctic explorer, died suddenly at Portland, Oregon, on the 2d of November, 1892. from an overdose of morphine.

He was born at Galena, Illinois, September 29, 1849, was graduated at the U. S. Military Academy in 1871, and served on garrison and frontier duty till 1877. He studied law and medicine, was admitted to the bar of Nebraska in 1875, and received his medical degree at Bellevue Hospital College, in 1876.

Accompanied by Mr. Wm. H. Gilder, Schwatka sailed for King William's Land, in 1878, to search for traces of Sir John Franklin's party. The search was successful; many of the skeletons of Franklin's men were discovered and buried; the grave of Lieut. John Irving, of the *Terror*, was found, and also a copy of the Crozier record.

The party made the longest known sledge journey, both in regard to time and distance, having been absent from its base eleven months and twenty days, and having travelled 3251 miles.

Once during this journey the thermometer marked −71° Fahr., and the average temperature for sixteen days was 100° below the freezing point.

Lieut. Schwatka afterwards explored the Yukon river, which he descended from its head-waters to its mouth.

In 1884 he resigned his commission in the army, and two years after he conducted the expedition sent to the Mt. St. Elias region by the proprietor of the *New York Times*.

On his return from Alaska he made his home at Rock Island, Illinois.

With his trained intelligence and his experience, his courage and great powers of endurance, he was fitted, as few men are, to do excellent work in Arctic travel;

and in the ordinary course of events there were many years of activity yet before him when he died.

TITLES OF PAPERS IN GEOGRAPHICAL JOURNALS.

BERLIN. — *Verhandlungen der Gesellschaft für Erdkunde.*

Demavend (Sven Hedin)—Communications on his Explorations this year in Eritrea (by G. Schweinfurth)—Dr. Schott's Third Report on his Voyages in East Asiatic Waters—Geographical Names in the German Protectorates —Dr. Konrad Kretschmer on Columbus as a Cosmographer.

Zeitschrift.

The History of the Discovery of America by the Scandinavians (by E. Gelcich)—Projections Showing the True Surface According to Latitude and Longitude for Maps of South and North America and Australia (by Dr. Alois Bludan).

EDINBURGH.—*Scottish Geographical Magazine.*

A Journey Through Lesser Tibet. By Mrs. Bishop, F.R.S.G.S.—A New Chart of the Currents of the North Atlantic. By H. S. H. Albert, Prince of Monaco—Meteorological Observatories in the Atlantic Ocean. By H. S. H. Albert, Prince of Monaco—The Tribes of Mashonaland and their Origin. By J. Theodore Bent — Some Features of the Ruined Temples of Mashonaland. By Rob-

ert M. W. Swan—Explorations in the Loangwa-Zambesi Basin. By Daniel J. Rankin, F.R.S.G.S., M.R.A.S.—A Recent Journey in Northern Korea. By C. W. Campbell, H. M. Consular Service, China—Ancient Imaus; or, Bam-I-Dunia, and the Way to Serica. By Robert Michell, Member of the Imperial Russian Geographical Society—The First Italian Geographical Congress. By Dr. George Smith, C.I.E., F.R.G.S.—Characteristics of African Travel. With notes on a journey from the East Coast to the Albert Lake. By F. D. Lugard.

GOTHA.—*Petermanns Mitteilungen.*

Preliminary Communications Concerning Two Works on the Aurora Borealis. By Sophus Tromholt—Lambert's Azimuth Projection for the Map of Africa. By Dr. Alois Bludan—The Exploring Expedition of the *Gazelle* in 1874-1876. By Dr. Willi Ule—Contributions to the Geography of Asia Minor. By Dr. W. Ruge—Map of the Flora of North Germany from the 12th to the 15th Century. By Dr. Ernst H. L. Krause—The Lake of Izabal, Guatemala. By Dr. Karl Sapper—A New Type of Cave. By K. K. Regierungsrat F. Kraus—The German Missionary Enterprises in Nyassaland. By Dr. H. Wichmann—Languages in Schleswig. By Paul Langhaus—Langhaus's German Colonial Atlas. By Prof. Dr. A. Supan—The Danish Expedition

to East Greenland in 1891–92—Earthquakes in Greece and Turkey in 1891.

Ergänzungshefte 104, 105.

The Cordillera of Bogotá. By Dr. Alfred Hettner—Scientific Results of Dr. F. Nansen's Crossing of Greenland in 1888. By Prof. H. Mohn and Dr. F. Nansen.

LONDON.—*Proceedings of the Royal Geographical Society.*

British Guiana; The North-western District. With Maps and Illustrations. By Everard F. Im Thurn, M.A., C.M.G.—The Heights and Hollows of the Earth's Surface. By Prof. C. Lapworth, LL.D., F.R.S., F.G.S.—Lieut. Peary's North Greenland Expedition—Imerina, the Central Province of Madagascar, and the Capital, Antananarivo. With Discussion. By the Rev. James Sibree—Mr. Conway's Karakoram Expedition. By W. M. Conway, Esq.—Orthography of Native Geographical Names. By Lieut. Colonel J. C. Dalton, R.A.—Mr. Rockhill's Travels in North-east Tibet—Notes on M. Dauvergne's Travels in Chinese Turkestan. By Gen. J. T. Walker, C.B., F.R.S.—The Italian Geographical Congress of 1892—Some Notes on Recent Exploration in British New Guinea. By Coutts Trotter, Esq.—Travels from the East Coast to Uganda, Lake Albert Edward and Lake Albert. With Discussion. By Captain F. D. Lugard—The Öraefa Jökull and its First

Ascent. By Fred. W. W. Howell, Esq.—The Cordillera of Bogotá, Colombian Andes.

MADRID.—*Boletín de la Sociedad Geográfica.*

Investigations which show that Watling Island is the Guanahaní, called San Salvador by Columbus, and that it was the first island discovered and visited by the great Navigator. An address by Otto Neussel—Authentic Notices of the Famous River Marañon. By D. Marcos Jiménez de la Espada—The Treaties of Iyil. Memoir addressed to the Minister of State—The Factory of Rio del Oro. By D. Eduardo Lucini—The Coast of the Sahara, from Cape Bojador to Senegal—Report on the Progress of Geography. By D. Martín Ferreiro—Some Practical Observations on Colonization by the Marquis of Reinosa.

PARIS.—*Comptes Rendus de la Société de Géographie.*

Programme of the subjects to be considered by the Geographical Section of the Congress of Learned Societies to meet on the 4th of April, 1893, at the Sorbonne—Progress of the Work on the Zuider Zee—M. Leitner on the Pamirs—Dr. A. Yersin's Itinerary from the Coast of Annam to the Mekong River—Determination of Geographical Positions in Annam—M. Maistre's Expedition to the Sudan—Capt. Binger in Africa—Wild People in Sumatra—The Peary Expediton—M. Emile Levasseur on the First Italian Geographical Congress—M. Hamy's Report on the Huelva

Celebration—The Transcription of Geographical Names and the Metric System at the International Zoological Congress at Moscow—M. Charles Rabot at Jan Mayen and Spitzbergen—Reception of M. Jean Dybowski.

Bulletin.

Report on the Competition for the Annual Prize—Essay on the Temperature of the Circumpolar Regions, from International Observations (1882–83) and the Information furnished by Expeditions. By Jules Girard—An Exploration in Indo-China. By Etienne Aymonier—Itinerary from Sulimania to Amadia (1869). By C. de Korab Brzozowski—Exploration of the Ivory Coast (Lieut. Quiquerez), 1891—Hydrography of the Basin of the Ancient Oxus. By Edouard Blanc—Meteorological Observations and Notes on Central Asia and particularly on the Pamirs. By G. Capus—Travels in the Country of the Tzarzas and in the Western Sahara. By Léon Fabert.

ROME.—*Bollettino della Società Geografica Italiana.*

On the Means of Promoting Ocean Exploration. Prof. A. Dohrn—On Tidal Observations in Italy and especially at Ischia: Prof. G. Grabbowitz—On Phototopographical Surveys: Eug. P. Paganini—On the Progress in Geographical Astronomy in Determination of Latitudes, etc.: Dr. F. Guarducci—On the Advances made in Cartography: Lieut. Col.

A. Botto—On the Construction of the Map of Ethiopia by the General Staff: Capt. E. de Chaurand—On the Exploration of the Caves of Italy: Prof. A. Issel—Plan of a Geographical Station in the Antarctic Regions: Lieut. G. Roncagli—On the Utility of a *Catalogue Raisonné* of Maps for all Italy: Prof. G. Marinelli—On Cosmographical Globes: Prof. M. Fiorini—An Italian Dictionary of Place-Names: B. Bianchi—Letter of King Menelek II to the Society—Musical Observations in Eritrea: Capt. E. Fiori—Botanical Excursion to the Habab Country: Dr. A. Terracciano—Letters of A. de Brito and P. Centurione, with Notes by the Abbate P. Peragallo—Geography at the National Exhibition at Palermo: Prof. P. Pennesi—Girolamo Segato, Traveller, Cartographer and Chemist: Dr. A. Wolynski.

WASHINGTON LETTER.

WASHINGTON, December 20, 1892.

VARIATION OF LATITUDE.—At the instigation of the International Geodetic Association, observations have been in progress for the last three years at several locations in the northern hemisphere for the purpose of inquiring into the supposed variation of the geographical latitude, and for investigating its laws of change.

The assistance afforded by the United States Coast and Geodetic Survey for the elucidation of the phenomenon consists in the occupation of three stations, at which latitude observations were to be made over a space of at least one year. These stations were Rockville, Md. (near Washington), San Francisco, California, and Waikiki (near Honolulu), Hawaiian Islands.

The observations at Rockville (Washington), made by Assistant Edwin Smith, have been reduced and discussed by Prof. Charles A. Schott, who says that the results of the astronomical observations specially made for the last three years leave no further doubt of the fact that the longitude of a place is slightly variable. "The phenomenon, as deduced from observations in Europe, in North America, and the Hawaiian Islands indicates a periodic variation such as would be produced by the revolution of the axis of rotation about that of the earth's figure." *

* U. S. C. & G. S. Bulletin No. 25.

Mr. Smith gives an interesting description of the station at Rockville, and the instruments and methods of observing.

The results of the work of Assistant E. D. Preston, at Waikiki, and of Assistant George Davidson, at San Francisco, will soon be ready for publication.

GEOGRAPHIC NAMES.—The United States Board on Geographic Names has issued no bulletin during the past year. The forthcoming annual report will probably contain no new information, but be simply a progress report. A dictionary of Alaskan geographical nomenclature, accompanied by maps showing the location of the names, is one of the possibilities of the future. There is a large amount of valuable material available for this purpose.

NEW GEOGRAPHY.—Mr. Johnson Nickens, U. S. Consul at Barranquilla, in the September issue of the *Reports from Consuls of the United States*, describes the great Magdalena River, which extends 1,000 miles through the best portion of the Republic of Colombia, draining an estimated area of 110,000 square miles. The tributaries and islands of the Magdalena, its natural history, towns, cities, lands and woods, products, commerce and public works are sketched in a manner both entertaining and instructive.

In the same publication Mr. Philip Carroll, Consul at Demerara, presents the best recent account of the inhabitants and industries of British Guiana. Most people will be surprised at the possibilities of this tropical country. Mr. Carroll gleaned much from conversations

with gentlemen of the colony, and used such opinions rather than his own. He concludes that the colored race of the colony is different from the colored race in the United States, and not at all comparable to the latter, although he has met lawyers, doctors and editors who will compare favorably with many and excel some of their brethren of the white race in the same vocations there or elsewhere.

He describes nearly one hundred varieties of elegantly colored woods, suitable for furniture and house trimmings, which would be appreciated in other parts of the world if better known.

In his "Investigation of the Coast Waters of South Carolina with reference to oyster-culture," Mr. John D. Battle, who was formerly associated with Lieut. Francis Winslow, U. S. Navy, in a similar survey of North Carolina, describes with corresponding particularity and accuracy the numerous coast streams of South Carolina. The coast region of South Carolina consists chiefly of very low country, which in many places extends inland a considerable distance. It is indented or cut through by a number of sounds, bays and river mouths, which are connected by an intricate system of winding creeks and rivers, separating the sea islands from one another and from the mainland. The intricacy of the system will be appreciated when it is stated that the investigations extended over seventy-one streams within the comparatively narrow region of this coast country. Six maps based on Coast Survey explorations accompany the report, which will be part of the next Bulletin of the U. S. Fish Commission.

Mr. Thomas J. Vivian, of the Census Bureau, has

formulated some new geographical work, in a report on the "Rivers of the Mississippi Valley," describing with considerable detail the numerous tributaries of the three great streams—the Mississippi, the Missouri and the Ohio.

MINERAL PRODUCTS.—A highly important chart, exhibiting the mineral products of the United States for the calendar years between 1880 and 1891, has recently appeared. It was prepared by Dr. David T. Day, Chief of the Division of Mining Statistics of the United States Geological Survey, and Special Agent of the Census Bureau in charge of mines and mining. It will be a surprise to everybody to find that the phenomenal product of 1890, which was over $69,000,000 more than 1889, was kept up and even slightly surpassed in 1891, in spite of the Baring Bros. disaster, which undoubtedly kept the mineral product from a significantly greater increase. It goes to show that something like $650,000,000 of mineral products can be counted on as about the standard output of the present time; that even a slight pushing of the product will put it beyond $700,000,000, and that a product of less than $650,000,000 means some significant depression in the mining industry. The exact total product of 1891 was $668,524,537, of which $356,216,615 was non-metallic—(value at the point of production)—$302,307,922 metallic, and $10,000,000 unspecified.

Few people are aware of the enormous development of the mineral resources of the country during the last decade. In 1881 the value was about $400,000,000, and did not exceed $500,000,000 until 1887. The year

1890 showed an increase of nearly $100,000,000 over 1889, and the year 1891 distanced the previous year by over $10,000,000; indicating for both years the phenomenal prosperity of the country.

While the development has been general all along the line, several instances are quite phenomenal. Asphaltum for instance, yielded but $8,000 in 1881, but in 1891 the output had increased in value to $242,264. Mineral paints rose from $100,000 in 1881 to $658,478 in 1891. The product of natural gas was first reported in 1882 at $215,000. In 1891 it had risen to $18,000,000, which was a slight decrease from, the previous year. Aluminum was first reported in 1883 at $875. In 1891 the value was $100,000. The copper product was valued at $12,000,000 in 1881, and $38,000,000 ten years later. The yield of silver nearly doubled, while that of gold was slightly less.

Not less interesting are the inverse developments of other industries. The product of nickel, for instance, yielded but $71,000 in 1891 ; while in 1881 it was $292,000. Millstones descended the scale from $150,000 (1881) to $16,587 (1891); Mica, from $250,000 to $100,000 ; while marls, which were valued at $500,000 in 1881, are threatened with extinction.

Dr. Day has outstripped all his associates in the Census Bureau by weeks (and perhaps by months) in completing the first of the final reports of the Census of 1890. This result is due not only to his own zeal and skilful management, but to the high character and efficiency of the several specialists who were his collaborators. Charles Kirchoff, editor of *Iron Age*, treated of copper, lead and zinc. John Birkenbine, an expert

in furnace construction, held "Iron Ores." Richard P. Rothwell, editor of the *Engineering and Mining Journal*, produced the most reliable statement of the product of gold and silver yet published in this country. His work has been separately published by the *Scientific Publishing Company of N. Y.* Only a brief statement of the results has been published in advance of the complete report, and practically nothing of the detailed tables and the comparisons of the product with previous years and with foreign countries. James Butterworth Randal, a recognized authority in the collection of quicksilver statistics, had charge of that field and carried the work through in spite of severe illness. Dr. Charles A. Ashburner, formerly of the Second Geological Survey of Pennsylvania and also of the U. S. Geological Survey, and John H. Jones were jointly assigned to the coal inquiry. Dr. Ashburner died before the work had well begun. Dr. William C. Day had a very difficult subject to treat—that of stone production; but his work was ready for publication in advance of all the others.

Joseph D. Weeks, editor of the *American Manufacturer and Iron World*, assumed charge of reports on petroleum, natural gas and manganese. Mr. Weeks is also high authority on coke and glass industries. To Mr. George F. Kunz, of New York, was assigned a branch of inquiry not attempted in any previous census—a statistical compilation of the finds of precious stones. There are few regular mines for precious stones in this country, and the work of tracing the occasional finds of gems, amounting in all to a considerable total value, is one which must be tried to be appreciated. Mr.

Kunz (of Tiffany & Co.) is the author of the celebrated "Gems and Precious Stones of North America." The aluminum industry has arisen since the census of 1880. It is, therefore, for the first time treated in the present volume by Mr. R. L. Packard. The industry of producing and selling mineral waters is also for the first time treated in the Census reports, by Mr. Albert C. Peale. All the statistics of precious metals and other minerals, except quicksilver, of California were collected by Charles G. Yale, editor of the *Mining and Scientific Press.*

Some of the most interesting features of the Census report of 1880 have been omitted entirely in 1890. The inquiry has been limited to an enumeration of the productive mining establishments of the country, the amount and value of their products, the number of persons who obtained a livelihood by these industries, the total amount received as wages by these employés, the number of days in a year on which they received steady employment, and the principal items of capital concerned in mining operations. Topics relating to accidents in mining, details of materials used, and everything in regard to mining methods were abandoned. Dr. Day claims that abundant experience has shown that complete technical statements for all branches of the mining industry are out of the limits of time for a census. Consequently only those lines of work were selected which could not easily be carried out by any other agency than a national census.

Probably no census feature has been so well described graphically as the railway mileage of the world in 1890. Mr. Henry C. Adams makes a most interest-

ing exhibit of the subject in *Extra Census Bulletin*, No. 24. There are seven pages only of text; but the seven diagrams and one base map exhibit (1) Railway mileage of the world by countries. (2) Miles of railway per 100 square miles by countries. (3) Miles of railway per 10,000 inhabitants by countries. (4) Railway mileage of the United States, 1830 to 1890, by territorial groups. (5) Railway mileage in the United States per 100 square miles of territory, 1830 to 1890. (6) Railway mileage in the United States per 10,000 inhabitants, 1830 to 1890. (7) Railway mileage of the United States by territorial groups. In 1830, when many now living were young men, there were less than forty miles of railways in the country. In 1840 there were about 2800; in 1850 not more than 8771; in 1860 the number had swelled to 28,919; in 1870 to 49,168 miles; in 1880 to 87,724, while 1890 gives the astonishing total of 163,597 miles, which is 44.18 per cent. of the whole mileage of the world, and exceeds by 3942 miles the entire mileage of Europe, Asia and Africa. It rarely occurs that so much information is so lucidly and accurately afforded in such brief space as in this Bulletin.

Bering Sea Arbitration.—The questions to be decided by the arbitrators soon to meet in Paris are:

What exclusive jurisdiction in the sea known as the Bering Sea, and what exclusive rights in the seal fisheries therein, did Russia assert and exercise prior and up to the time of the cession of Alaska to the United States?

How far were these claims of jurisdiction as to the

seal fisheries recognized and conceded by Great Britain?

Was the body of water known as the Bering Sea included in the phrase "Pacific Ocean" as used in the treaty of 1825 between Great Britain and Russia, and what rights, if any, in the Bering Sea were held and exclusively exercised by Russia after said treaty?

Did not all the rights of Russia as to jurisdiction and as to the seal fisheries in Bering Sea east of the water boundary in the treaty between the United States and Russia of the 30th of March, 1867, pass unimpaired to the United States under that treaty?

Have the United States any right, and if so, what right, of protection of property in the fur seals frequenting the islands of the United States in Bering Sea when such seals are found outside of the ordinary three-mile limit?

The tribunal is composed of seven arbitrators, and from its decision there is no appeal. On the part of the United States there are two arbitrators, Hon. John T. Morgan, of Alabama, and Justice John M. Harlan, o Kentucky. On the part of Great Britain, two; the Right Honorable Lord Hannen, of England, and Sir John S. D. Thompson, of Canada. On the part of France, Baron de Courcel; Italy, Marquis Emilio Visconti Venosta; Sweden-Norway, G. W. W. Gram. Hon. John W. Foster, the Secretary of State, will be the official agent of the United States, and Mr. C. H. Tupper, of Canada, that of Great Britain. The counsel on the part of the United States are Henry W. Blodgett, of Chicago, Edward J. Phelps, of Vermont, and James C. Carter, of New York. In addition, Thomas

Corwin Mendenhall, of the Coast Survey, Dr. C. Hart Merriam, Naturalist of the Department of Agriculture, Sir George Baden-Powell, M.P., and Professor George Mercer Dawson, director of the Canadian Geological Survey, are retained as special commissioners by the United States and Great Britain respectively, in the case of a certain contingency.

The decision in the controversy will determine for all time the control of a very large sea, and fisheries of incalculable value. The attention of the whole world will be drawn to the deliberations and conclusions of this high commission.

The tribunal will assemble on the 23d of February next. Data, facts and arguments on both sides have been assiduously gathered on every point, and the case, counter case and arguments are near the state of completion. The conclusions of the tribunal are looked for in July or August, 1893.

The dispute about to be settled originated only seven years ago (1885), when the seal-poaching craze first broke out among the Canadians. In 1886, one American and three Canadian schooners were seized for poaching. In 1887 a larger number were seized, and in 1888 the seizures were stopped pending propositions for arbitration. In 1889 seizures were resumed by United States cutters, and since then by both American and British cutters, although it is stated that more poaching and destruction of seals has taken place in that period than ever before; that from 350,000 seals annually destroyed not more than 55,000 skins have been taken each year.

NICARAGUA CANAL—PROGRESS OF CONSTRUCTION.—The work of actual construction was inaugurated October 8, 1889. The necessity of a safe entrance from the Atlantic required the restoration of the harbor of San Juan del Norte. To this end a massive breakwater has been pushed out about 1000 feet A railroad track has been laid to facilitate the handling of building material and other supplies. With the construction of this breakwater the sand spit that thirty years ago closed the old port of San Juan disappeared, without the assistance of any dredge or other artificial aid; and where six months before there was a sand bank 3 or 4 feet above the sea level there was in the winter of 1890–91 a depth of water of about 15 feet, which has since been maintained. The first deep-sea vessel to enter the restored harbor was the *Sverdrup* with a cargo of machinery.

Permanent structures for headquarters, hospital, camp etc., covering 75,902 square feet, have been erected in the immediate vicinity of San Juan, also, extensive wharves, and tramways.

The canal line has been cleared of forest growth for a distance of ten miles back from the coast, and for nine miles on the west side of Lake Nicaragua. This clearing is 486 feet in width.

A telegraph line to the interior connecting with the telegraph system of the country and with ocean cables, and covering a distance of sixty miles, has been completed. To protect this line from damage by falling timbers it was necessary to make a clearing of the forest along the line to a width of about 100 feet.

The rock-cutting of "The Eastern Divide"—the heaviest single body of work to be accomplished on the

whole line of the canal, required the construction of a railroad through impassable swamps, for transporting machinery, etc. Eleven miles of this road have been constructed and equipped, and but seven miles now remain to be built to reach the Eastern Divide. The railroad line between Lake Nicaragua and the Pacific is also located and made ready for construction.

Dredging on the canal line west of the harbor of San Juan del Norte has been uninterruptedly carried forward, and a mile of channel excavated 17 feet deep and varying in width from 150 to 230 feet. This has been accomplished by the purchase and use of the extensive and valuable plant formerly used on the eastern end of the Panama canal.

Nearly all the skilled employés have been hired in the United States. Natives of Central America and negroes from Jamaica have been employed for unskilled labor. The employés are housed, fed, and supplied with medicine and hospital attendance by the company. No Chinese or other Asiatic workmen are employed.

No change in the location of the line of the canal first decided upon has been made except in one instance, where it has been discovered that a curve may be eliminated with a saving in excavation of upwards of 600,000 cubic yards, and in distance of 1000 feet.

Medical organization and the system of sanitation have proved exceedingly valuable in maintaining a death rate greatly below that of any other known large work of construction; in fact, below the death rate of hospitals in the United States, the difference being, as between the Roosevelt Hospital, New York, and the Nicaragua hospital, 8.38 per cent. in favor of the latter. Chagres fever is entirely unknown, and most of the diseases met

with have been mild in type. The mean temperature during 1890 was 77.25°; during 1891 the mean was 81°.

The work accomplished to date may therefore be summarized as follows:

(1) The prosecution of the final surveys for location and construction and surveys for economical improvements as to details.

(2) The subterranean examinations of the strata requiring removal by means of boring with the diamond drill.

(3) The restoration of the harbor of San Juan del Norte to the extent of securing an easy entrance to the port for vessels of moderate draft.

(4) The construction of extensive wharves and landing facilities.

(5) The erection of permanent buildings for offices, quarters, hospitals, storehouses, shops, etc., having a floor area of an acre and three-fourths.

(6) The building of a large number of temporary camps along the line for accommodation of employés.

(7) The completion of a telegraph line permitting ready communication with the work.

(8) The clearing of the canal line of timber for some 20 miles.

(9) The completion of surveys for location and of plans for construction of the railroad system, and the construction and equipment of 11 miles of this line.

(10) The acquisition by purchase of the most valuable and powerful dredging plant to be found in America under one management.

(11) The fitting up and operation of this plant and the opening of over a mile of the canal.

(12) The acquirement by purchase of the valuable and exclusive franchise for the steam navigation of the San Juan River and Lake, together with the extensive plant of the Navigation Company, consisting of offices, lands, steamboats, tugs, lighters, repair shops, etc.

(13) And lastly, what is felt to be the most important result of all is the demonstration, secured by experience, of the salubrity of the climate, the efficiency of labor, and the sufficiency of the estimates of the chief engineer for the harbor and canal dredging and railroad work.

The government of Nicaragua, by a communication dated November 8, 1890, has officially recognized and declared that the Company has more than complied with the provisions of article 47 of the concession, requiring the expenditure of $2,000,000 during the first year of the work. This formal acknowledgment confirms the Company's title to the concessionary rights for a term of ten years in which to complete the canal.

A detailed description of the proposed canal and the work to be accomplished in its construction, together with the maps showing the route thereof as the same has been finally located, was annexed to the annual report of the Company for the year 1890.

Favorable action by Congress on matters affecting the interests of this undertaking will guarantee beyond question the completion of the most important American enterprise of the century. H.